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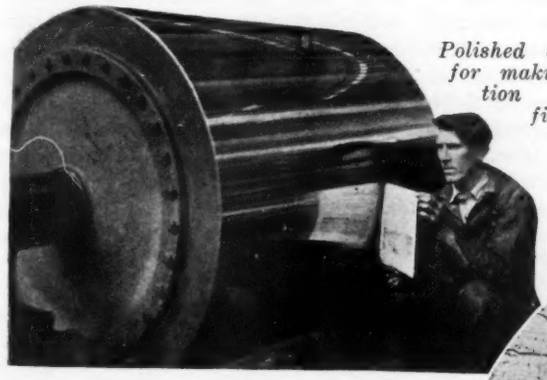
Technique for Welding 18-8 Alloys Proves Simple

Characteristics of Low and High-Carbon Grades of Chrome-Nickel Steels Should Be Known Before Fusion Operation Is Undertaken

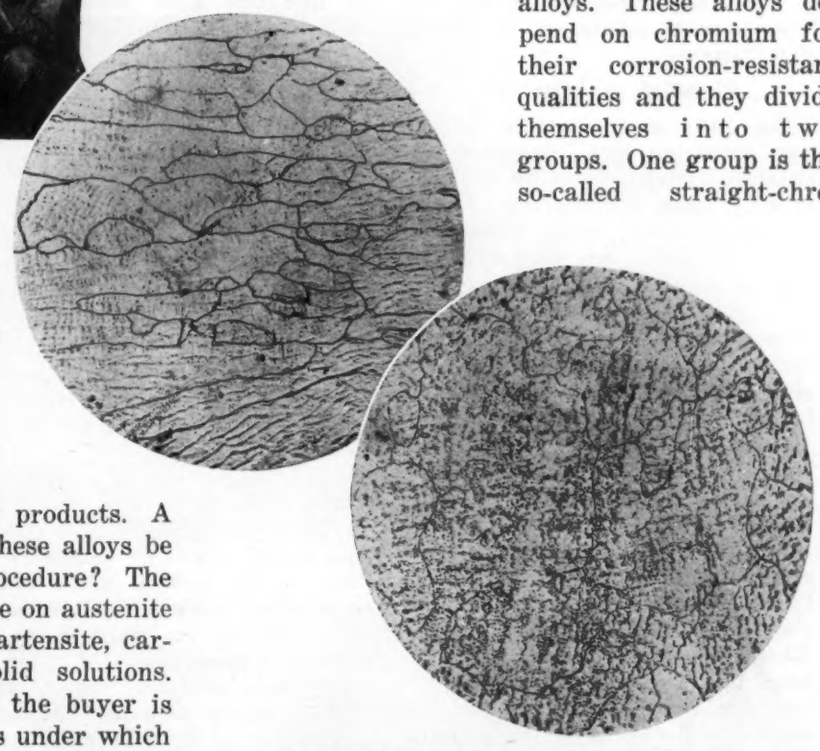
By R. D. Thomas

President, R. D. Thomas & Co.

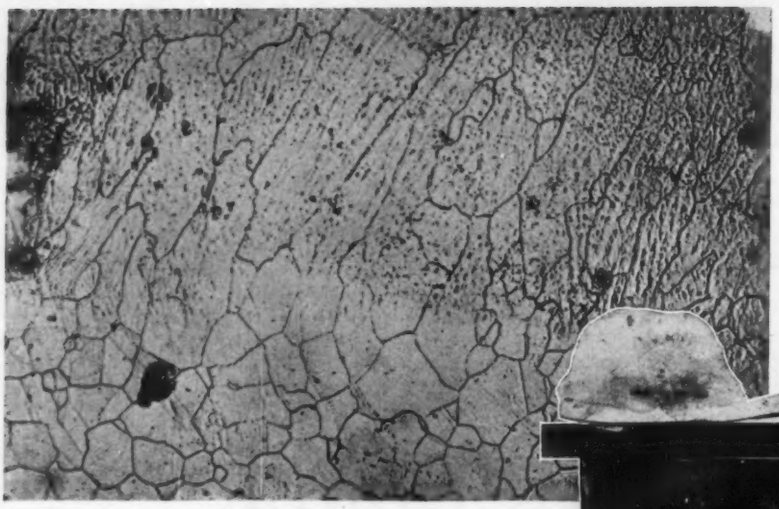


Polished cylinder for making motion picture films

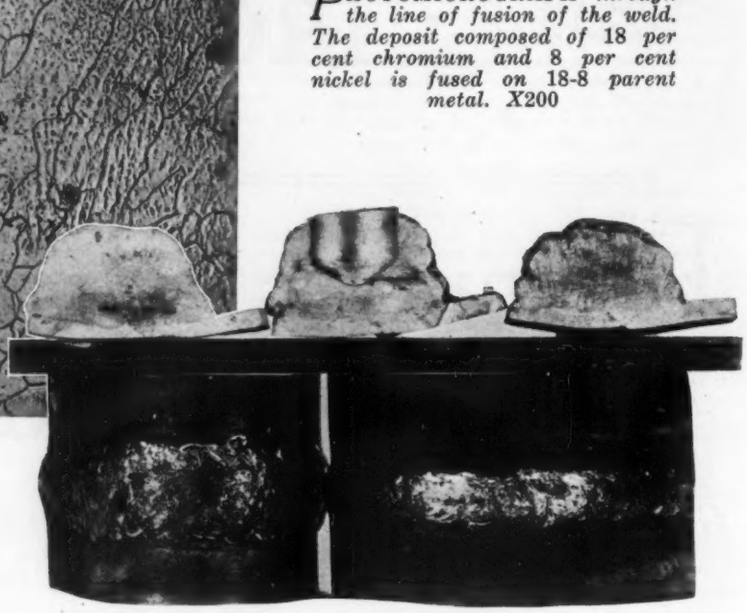
MANUFACTURING plants, which employ arc welding for the fabrication of various products are receiving an ever increasing number of requests to make their product of stainless irons and corrosion resistant steels. The demand for articles of these recently-developed metals includes tanks, boxes, window frames, pipes, and numerous other products. A question frequently asked is: Can these alloys be welded and, if so, what is the procedure? The answer likely will include a discourse on austenite crystals, gamma iron, delta iron, martensite, carbon in grain boundaries, and solid solutions. Then, too, in purchasing the metal the buyer is confronted with various trade names under which the metal is marketed. To complicate the matter further each trade named alloy is made in different analyses and presumably only one is the right grade for the particular article to be manufactured by the welding process. There are short cuts for a sufficient understanding of the problem, however, and one need not be a metallurgist or a physicist to gain enough knowledge for the proper handling of these useful alloys. These alloys depend on chromium for their corrosion-resistant qualities and they divide themselves into two groups. One group is the so-called straight-chro-



PHOTOMICROGRAPHS of weld metal of 2-layer weld of 18-8 metal. Bottom bead is shown in center; top bead at right



PHOTOMICROGRAPH through the line of fusion of the weld. The deposit composed of 18 per cent chromium and 8 per cent nickel is fused on 18-8 parent metal. X200



CROSS section of weld in 18-8 alloy. Double and single bead bent through 180 degrees over ¾-inch radius mandrel is shown at the lower left and right respectively

mium steels or irons. They contain 12 per cent or more of chromium and generally are termed "stainless." They resist atmospheric oxidation and the milder acids such as the fruit acids, and constitute the group from which cutlery is manufactured. The more chromium they contain, the higher is their corrosion-resistant quality. They can be hardened by heat treatment and drawn to temper in the same way as carbon steels. They can be arc welded, but the results are liable to be unsatisfactory on account of brittleness.

Classified as Austenitic

The other group includes the alloys containing both chromium and nickel in sufficient quantity to make an alloy which the metallurgist terms austenitic, thereby meaning that the chromium, nickel and carbon are in solid solution in the grains of pure iron. In other words, the alloying elements do not form compounds with the iron but dissolve in it and thereby give it the ability to resist the attack of many acids and to stand up against scaling when subjected to heat under oxidizing conditions. This group of austenitic alloys is readily arc welded with satisfactory results. It is easily differentiated from the less satisfactory, straight-chromium irons by the fact that the chromium-nickel alloys are nonmagnetic when annealed. Whether a corrosion-resistant alloy belongs to the group of straight-chromium steels, which are unsatisfactory welding material, or to the group of chrome-nickel steels, which are satisfactory welding material, can be determined with a small magnet. Table I gives typical analyses of chromium-nickel alloy steels and stainless irons.

The most generally used chromium-nickel steels are those containing 18 per cent chromium and 8 per cent nickel, known as 18-8 alloys. It is this alloy that is most frequently encountered in the manufacture by welding of tanks, acid vats, nitric acid drums, and other articles immune to acid attack. Although this metal may be recognized by its nonmagnetic quality, this test alone does not give conclusive information that it is the proper alloy for welding. There are two types of chromium-nickel alloys, one containing carbon under 0.15 per cent, and the other over 0.20 per cent. Although both the low and high-carbon alloys can be arc welded readily, the metal with the higher carbon content is not satisfactory from the welding standpoint because it must be annealed after welding in order to give it the maximum corrosion-resistant qualities and necessary ductility. The low-carbon alloys do not require annealing or heat treating and the resultant welds, if properly made, will be corrosion resistant, ductile and strong. Because of this difference in the characteristics of the low and high-carbon alloys, it is necessary in welding to know which grade is being worked. The low-carbon alloy is the most useful from a welding standpoint since many of the products cannot be heat treated readily.

Heat Treatment Necessary

If, for some special reason, it is necessary to employ the high-carbon alloy, it must be heat treated after all welding and other work has been completed, bearing in mind that it is heat treated in exactly the reverse manner from ordinary carbon steels. When ordinary steels are heated beyond the critical point and suddenly chilled, they become hard. The austentic steels, to which this group belongs, are made soft and ductile by sudden chilling from a high temperature. The so-called heat treatment, therefore, is an anneal. The actual treatment is to bring the steel slowly to a temperature ranging from 1100 to 1200 degrees Fahr., then rapidly

Discloses Welding Data

STAINLESS irons and steels resistant to corrosion are finding wide application in the fabrication of many commodities by the arc welding process. The carbon content of the metals has an important bearing on their weldability. The high-carbon alloy must be subjected to an anneal following welding, otherwise corrosion-resisting qualities and ductility will be lacking. The amount of expansion on heating and contraction on cooling also must be considered. The precautions necessary and the procedure followed in the welding of chromium-nickel steels are explained in the accompanying article which is an abstract of a paper presented before the Philadelphia section of the American Welding society, May 19. The author is president of R. D. Thomas & Co., Philadelphia.

to 1950 degrees Fahr. and finally quench in water. If desired, it then may be hardened by what normally is the tempering operation for ordinary carbon steels.

This necessity for heat treating the high-carbon 18-8 metal is mentioned to emphasize the difference from the welding standpoint of the two types of alloys. The shop, which is fabricating welded articles of corrosion-resistant steels, should choose the low-carbon alloy which requires no heat treatment. By low carbon is meant an alloy having under 0.15 per cent carbon. Table II gives the typical physical qualities of 18 per cent chromium, 8 per cent nickel alloy usually encountered for arc welding. Table III gives the 14 per cent straight chromium irons.

Table I

Typical Analyses of Chromium-Nickel Steels and Stainless Irons

Chromium-Nickel Alloy Steels

	Chromium per cent	Nickel per cent	Carbon per cent	Silicon per cent
Rezistal 2-KA-S	17.0 to 19.0	7.0 to 10.0	0.07 max.	1.00 max.
Rezistal 2-KA	17.0 to 19.0	7.0 to 10.0	0.15 max.	1.00 max.
Rezistal 2-C	17.0 to 19.0	7.0 to 10.0	0.20 max.	2.0 to 3.0
Allegheny metal	17.0 to 20.0	7.0 to 8.0	0.20 max.	0.50 max.
Ascoloy 44	20.0 to 30.0	10.0 to 20.0	0.20 max.	0.50 max.
Enduro KA-2	16.5 to 19.5	7.0 to 10.0	0.15 max.	0.75 max.
Carpenter stainless No. 4	18.0	9.5	0.10	
Rezistal 2600-S	8.0 to 10.0	21.0 to 23.0	0.15 max.	1.20 to 1.70

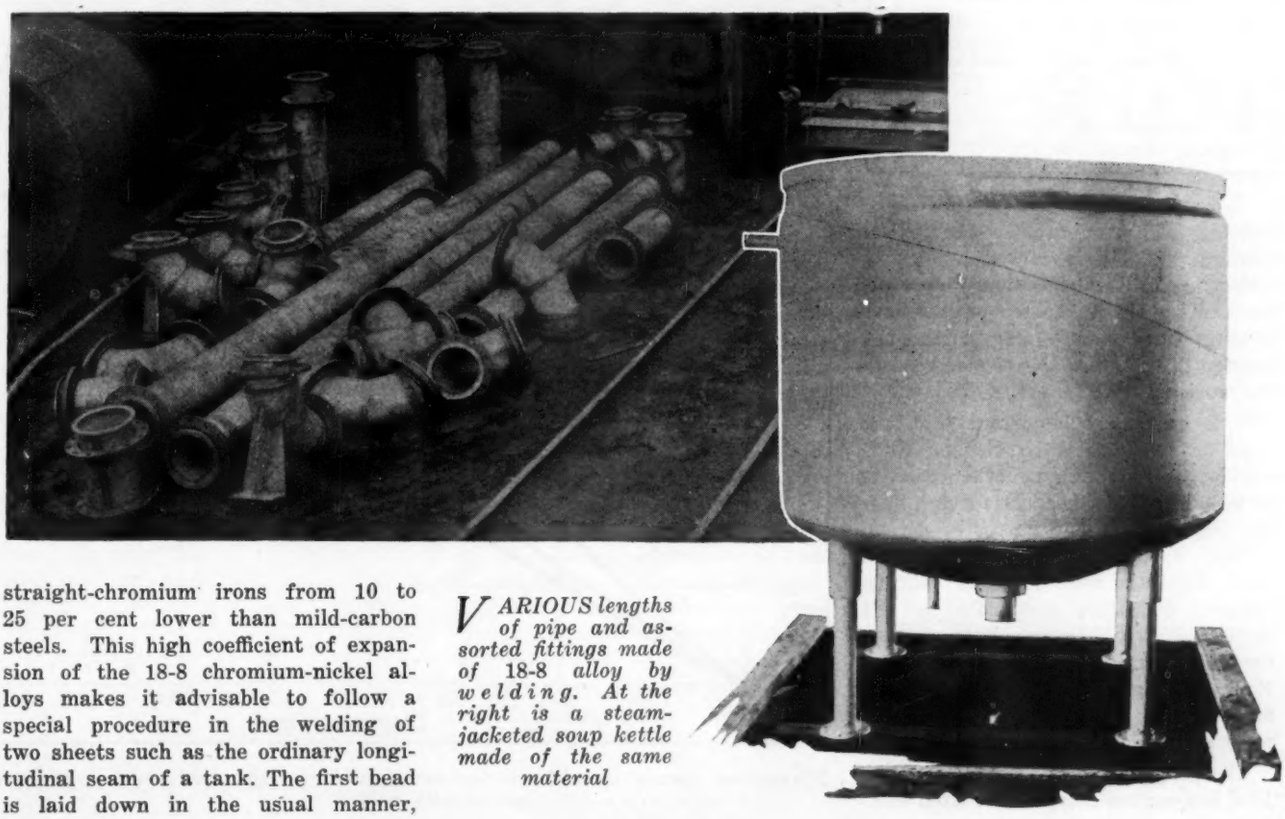
Straight Chromium Irons

Ascoloy 33	12.0 to 16.0	.....	0.12 max.	0.50
Stainless iron No. 18	17.0 to 19.0	.....	0.10 max.	0.50 max.
Duraloy stainless 18	17.0 to 19.0	.....	.....	.....
Duraloy stainless 14	12.0 to 16.0	.....	.....	.....
Carpenter stainless No. 2	12.0 to 14.0	.....	0.30	.....
Carpenter stainless No. 1	12.0 to 14.0	.....	0.10	.....
Ascoloy 55	26.0 to 30.0	0.60	0.25 max.	0.60

Amount of Expansion Important

An important physical characteristic of any metal to be welded is the amount of expansion on heating and consequent contraction on cooling, because this quality determines the cooling strains which will be set up in the weld deposit. These cooling strains are frequently large and cause cracked and unsatisfactory welds. They must be considered in the design of the weld and in the actual welding procedure in order to permit them to relieve themselves as much as possible. The expansion of 18-8 chromium-nickel steel is about 50 per cent higher than mild-carbon steel and that of the straight-chromium irons from 10 to 25 per cent lower than mild-carbon steels. This high coefficient of expansion of the 18-8 chromium-nickel alloys makes it advisable to follow a special procedure in the welding of two sheets such as the ordinary longitudinal seam of a tank. The first bead is laid down in the usual manner, but the second bead should be started about 1 inch or more from the end of the seam, thus giving the effect of an open end to relieve contraction strains. This method does not give an actual open end, because of the bead already deposited, but the effect is that of an open end since the cold deposited metal of the first bead is ductile and its high elongation gives the necessary relief to the second bead. In welding seams on both sides, the same procedure of starting the second bead away from the end of the seam should be followed.

The actual welding operation on 18-8 alloys does not present any difficulties to the operator, the technique employed being the same as in arc welding mild-carbon steels. The operator must use reversed polarity, that is, the electrode must be connected to the positive pole of the welding generator and the work to the negative pole. The metal should be laid down with a smooth, overlapping weave and without puddling. Puddling the metal is bad practice because the best grain structure for this alloy is obtained by allowing the deposited metal to chill as quickly as possible. Puddling tends to hold



VARIOUS lengths of pipe and assorted fittings made of 18-8 alloy by welding. At the right is a steam-jacketed soup kettle made of the same material

Annealing box of 18 per cent chromium, 25 per cent nickel and high-silicon alloy

the metal at the higher temperature for an undue length of time and the resultant grain structure will be coarse. The proper welding current should be determined by making a few test welds and examining them to see that good fusion is obtained. The selection of current value should be the lowest with which it is possible to obtain good fusion. The arc length should be as short as possible in order to minimize the danger of oxidizing the weld metal while passing through the arc stream. In general, the arc voltage apparently will be somewhat higher than would be obtained on similar work for steel welding. This apparently higher arc voltage probably is caused by higher resistance of the chromium-nickel alloy and by the voltmeter on the arc-welding generator measuring the voltage drop across the electrodes and the work as well as across the arc.

Table II

Physical Qualities of 18-8 Alloy Steel

Tensile strength, lbs per sq. in.	85,000 to 90,000
Yield point, lbs per sq. in.	30,000 to 40,000
Elongation in 2", per cent	55 to 60
Reduction in area, per cent	70 to 75
Brinell hardness numeral	130 to 145
Coef. of expansion, deg. Cent.	16 x 10-6 to 22 x 10-6

It is extremely important that the bead of weld metal be cleaned thoroughly, even though no other bead is to be laid on top, because foreign substances may start a corrosive action. If the bead is sand blasted, clean sand should be used in order that no harmful corroding materials be left on the deposit. Inasmuch as foreign particles may start a corrosive action, it is good practice to make a smooth and neat bead thus leaving no crevices for their lodgment.

The proper electrode for welding the 18-8 low-carbon alloy is a coated electrode having a core of approximately the same analysis. The coating must produce a reducing atmosphere surrounding the arc or otherwise the weld metal will be oxidized and the resultant weld will be porous. The coating must contain no carbon because the weld metal will pick up this element readily and have its corrosion-resistant qualities destroyed. Furthermore, the coating must form a slag over the deposited metal and protect it while hot from oxidation. This metal also can be arc welded satisfactorily with the atomic hydrogen process.

Unsuitable for Welding

As previously stated, the straight-chromium irons containing 12 per cent or more of chromium, are not satisfactory for welding. If they are welded with a rod of approximately the same analysis as the parent metal, the resultant weld will have no ductility. They, however, may be welded with a properly prepared 18-8 chromium-nickel rod with satisfactory results.

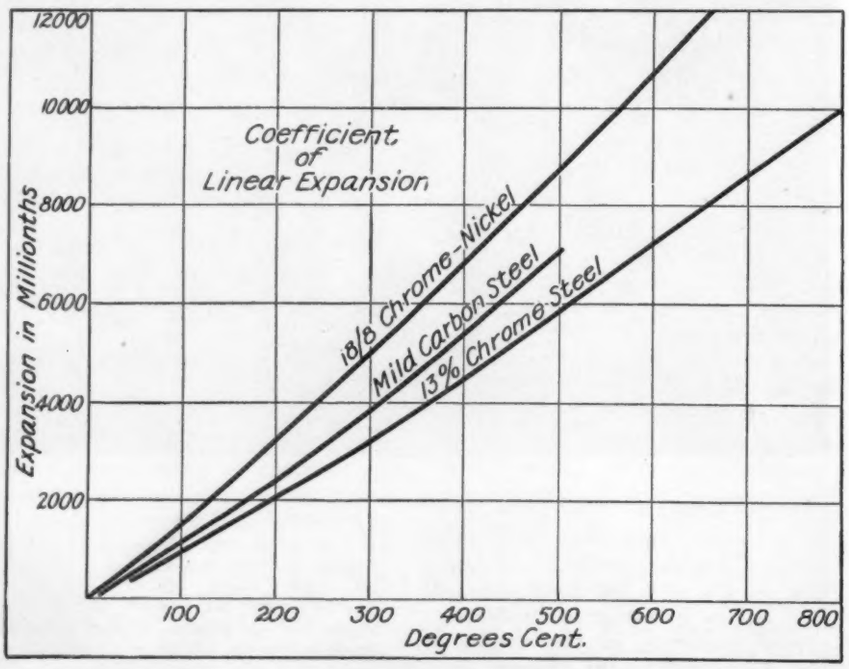
The foregoing discussion has stressed the 18-8 chromium-nickel type of alloy because it is the one most generally encountered. The usual analysis includes carbon under 0.15 per cent and silicon 1.0 per cent max. A modification of this analysis has silicon of 2 to 3 per cent. This higher silicon alloy is more highly heat resistant than a lower silicon alloy. Another heat-resisting alloy contains chromium 10 per cent and nickel 24 per cent. It also may be welded satisfactorily. The principal uses of the heat-resisting alloys are the manufacture of cracking stills, annealing and carburizing boxes, hearths of furnaces, and similar parts subjected to high temperatures.

Table III

Physical Qualities of 14 Per Cent Chromium

Tensile strength, lbs. per sq. in.	80,000 to 90,000
Elastic limit, lbs. per sq. in.	60,000 to 65,000
Elongation in 2", per cent	25 to 30
Reduction in area, per cent	55 to 60
Brinell hardness numeral	165 to 200
Coef. of expansion, deg. Cent.	0.000009 to 0.000012

Century Electric Co., 1806 Pine street, St. Louis, manufacturer of fans and motors, has increased its capital $5,000,000 to $7,500,000.



Elongation curves of 18-8 chrome-nickel and straight chromium irons compared with mild steel

Four Strong Steelmaking Groups Are Forming in Great Britain

By Vincent Delport

European Manager, Iron Trade Review

WHILE considerable interest has been attracted to the process of rationalization of the iron and steel industries which has been carried on in certain continental countries during recent years, a movement in the same direction is taking place in Great Britain, and in the past two years important mergers have been effected. As far back as in 1918, a certain number of individual iron and steel concerns amalgamated and formed new companies.

Among the earlier corporations referred to is the United Steel Companies Ltd., with head offices at Sheffield, which was formed in 1918 for the purpose of amalgamating the Workington Iron & Steel Co. Ltd., Steel, Peech & Tozer Ltd., Samuel Fox & Co. Ltd., the Frodingham Iron & Steel Co. Ltd., the Appleby Iron Co. Ltd., the United Strip & Bar Mills Ltd., Thomas Butlin & Co. Ltd., the Rothervale Collieries Ltd., and the United Coke & Chemicals Co. Ltd. Since the formation of the company the concern also has acquired the issued capital of several collieries, coke oven and by-product plant. The output capacity of steel ingots of the concern is equal to about 1,250,000 tons.

Financial Difficulties Encountered

Up to 1921 this company was operated profitably, but since 1922, and following the boom period, the concern suffered financial difficulties, and in 1928 and 1929 a financial reorganization was effected, which resulted in the formation, in June, 1929, of a holding company known under the name of Steel Industries of Great Britain Ltd. It should be noted that, with the exception of two or three of the smaller companies, each concern which is a member of Steel Industries of Great Britain Ltd., still exists and actually operates its works independently. In this respect Steel Industries of Great Britain Ltd., can be compared to some extent to the United States Steel Corp.

In 1920 Sir W. G. Armstrong, Whitworth & Co. Ltd., acquired the ordinary share capital of the Pearson & Knowles group (Warrington), which included the Pearson & Knowles Coal & Iron Co., Dallam Forge Co., Warrington Wire & Iron Co., Rylands Brothers, Partington Steel Co., (partly), and collieries (Wigan and Moss Hall).

Between 1920 and 1927 no consolidations of any importance were made in the iron and steel industries of Great Britain and it was during that period that Germany made considerable advance in that direction. During the latter part of that period conditions in the British iron and steel industries were deteriorating, and some of the larger companies found themselves in considerable financial difficulties. It then was realized that drastic measures would have to be taken to reorganize these concerns.

The first of the large companies to come to this decision was Sir W. G. Armstrong, Whitworth & Co. Ltd. and Vickers Ltd. and in December, 1927, the firm of Vickers-Armstrongs Ltd. was registered. The new company took over the Vickers works at Barrow, Erith, Dartford and Sheffield, and the Armstrong-Whitworth works at Openshaw, Elswick, and the naval yard at Newcastle-on-Tyne. The new company also took over subsidiary companies of the two firms, and the resulting group of Vickers-Armstrongs Ltd. concentrated on the manufacture of armaments, shipbuilding, plant for docks, harbors, bridges, cement works, collieries, railways, steelworks, etc., nonferrous metals and general engineering.

Another Corporation Organized

Some months later, in March, 1929, a new corporation was formed under the name of English Steel Corp. Ltd., which took over from Vickers-Armstrongs Ltd. on the one hand and from Cammell Laird & Co. Ltd. on the other the steel plants and marine engineering works of the two firms. In January that year a subsidiary of Vickers Ltd., the Metropolitan Carriage, Wagon & Finance Co. Ltd., took over the railway rolling stock works of the Cammell Laird group and formed the Metropolitan-Cammell Carriage, Wagon & Finance Co. Ltd.

Consequently, the large Vickers-Armstrong-Cammell-Laird combination now is organized as follows: (a) the English Steel Corp. Ltd. group, producers of steel, hydraulic plant, oil well, water and quarry drilling equipment, small tools, railroad and tram material, such as tires, axles, wheels, etc., and pumps; (b) the Vickers-Armstrong Ltd. group, manufacturers of ordnance, armaments, shipbuilding and general engineering; and (c) the

How British Industry Is Solving Problem

ECONOMIC pressure in British industry has been forcing what in Europe is called rationalization of plant. It is an effort to combine resources and to apply effort in the best available way, to afford economy and reduce expense to operation and selling.

In the accompanying article by the European manager of IRON TRADE REVIEW *the tendency of this movement is sketched and the steps already taken are given in detail. That four main groups are forming on geographical lines is evident from the mergers already made.*

That the process is well founded is proven by participation of the Bank of England through its Securities Management Trust, formed to facilitate rationalization of British industry. Governmental sanction is implicit in this arrangement and no legal obstacles to consolidation are present.

This development, which is noted in other countries of Europe, is one of the significant features of the present age of business and contains much food for thought.

Metropolitan-Cammell group for railroad rolling stock of all descriptions.

In addition to these groups there still remains of the original companies Vickers (Aviation) Ltd., manufacturer of aircraft and accessories for military and civil purposes, and there still exist the firms of Sir W. G. Armstrong, Whitworth & Co. (Engineers) Ltd., locomotive builders and general engineers, and Sir W. G. Armstrong, Whitworth & Co. (Shipbuilders) Ltd., who operate shipyards in the Newcastle-on-Tyne district.

Finally, in July, 1929, a company was registered under the name of Armstrong-Whitworth Securities Co. Ltd., which holds the stock of the engineering and shipbuilding firms of Sir W. G. Armstrong, Whitworth & Co. Ltd., and of the Pearson & Knowles group, acquired in 1920. Cammell Laird & Co. Ltd. still exists as shipbuilder and marine engineer.

Next in chronological order came the amalgamation of the South Durham Steel & Iron Co. Ltd., and the Cargo Fleet Iron Co. Ltd., the first-named company having acquired control of the latter. The works of these concerns are situated in the Middlesbrough district, and the capacity of steel production they combine is about 540,000 tons per annum. The company owns coal and iron ore mines, coke ovens, blast furnaces, steel plant and rolling mills, and is known as the South Durham Steel & Iron Co. Ltd., incorporating the Cargo Fleet Iron Co. Ltd.

Important Merger Consummated

In October, 1929, one of the most important mergers of the times took place when the Middlesbrough firm of Dorman, Long & Co. Ltd. acquired the controlling interest of Blockow, Vaughn & Co. Ltd., the company now being Dorman, Long & Co. Ltd., incorporating Blockow, Vaughn & Co. Ltd. The productive capacity of steel of this corporation is about 2,000,000 tons per annum and it operates extensive and modern plant for the making of pig iron and steel, and rolling mills for structural steel.

Early in 1930 two large steel-manufacturing concerns, David Colville & Sons Ltd. and William Beardmore & Co. Ltd., reached an agreement whereby, as from Feb. 1 the two companies agreed to prove their resources, not only as regards the technique of production, but also in buying and selling. It also was agreed that David Colville & Sons Ltd. should take over from William Beardmore & Co. Ltd. the latter's business in commercial steels, including plates, sheets, rails and axle-billets, while the Beardmore company now concentrate on the production of heavy forgings, wheels, axles, tires, armaments and guns. It should be understood that this is neither an amalgamation nor an acquisition of the interests of one firm by the other, but a working agreement arrived at in order to operate the plant of the respective companies in a more economical manner. An important feature of the arrangement is, that each, in the event of joining an industrial group, binds itself to maintain with regard to the other the policy which it has adopted.

The most recent step toward rationalization effected in Great Britain is the formation of the British (Guest Keen Baldwins) Iron & Steel Co. Ltd., which took over from Baldwins Ltd. and from Guest, Keen & Nettlefolds Ltd. the heavy steel interests of each of the member-companies. This company was formed on March 24 this year. The two original concerns were serious competitors in heavy iron and steel manufacture. Baldwins Ltd. bring to the new company their coke ovens, blast furnaces and steelworks at Margam, their steelworks and rail mills at Port Talbot, and the blast furnaces of the Briton Ferry Works Ltd. Guest, Keen & Nettlefolds Ltd. are bringing the Dowlais iron and steel works, the Cardiff and Dowlais iron and steel works and coke ovens.

Tend Toward Methodical Grouping

The above are the amalgamations or agreements which have actually materialized during the past three years. These arrangements show a tendency toward a methodical grouping of the iron and steel industry of the country, and it is pretty clearly indicated that eventually the industry of the United Kingdom will be divided between four main geographical groups: the Tees-side group; the Scottish group; the South Wales group; and a fourth group centralized in the Sheffield district, with ramifications as far as the Manchester and Newcastle districts. This impression is confirmed by the fact that negotiations are said to be conducted between the Dorman-Long-Bolckow, Vaughn group and the South Durham-Cargo Fleet group. Should these conversations materialize, the Tees-side group would be formed.

The nucleus of the Scottish group is seen in the arrangement between David Colville & Sons Ltd. and William Beardmore & Co. Ltd. while the recent amalgamation of Baldwins Ltd. and Guest, Keen & Nettlefolds Ltd. is the most marked development in the constitution of the South Wales group. In the Sheffield district there is the English Steel Corp. group linked up with Vickers-Armstrongs and Cammell Laird, and it also is reported that conversations are being carried on from time to time between these elements and the firms of Thos. Firth & Sons Ltd. and John Brown & Co. Ltd., which already are closely allied. Then again in Sheffield is the older-established corporation of the United Steel Companies Ltd., under the control of Steel Industries of Great Britain Ltd.

As this article is being written it is officially announced that the directors of Pearson & Knowles Coal & Iron Co. Ltd., of Warrington, and the Wigan Coal & Iron Co. Ltd., of Wigan, both in Lancashire, have decided to form two new companies, one being the Wigan Coal Corp. Ltd., which will take over all the assets of the merging companies, and the Lancashire Steel Corp. Ltd., which will take over all the iron and steel assets. It should be noted that Pearson and Knowles already control the firms of Rylands Brothers Ltd., manufacturers of wire products, the Wigan Junction Colliery Co. Ltd., the Partington Iron & Steel Co. Ltd., and they also partly control the Moss Hall Coal Co. Ltd. It is interesting to note that this consolidation is effected with the participation of the Bank of England and the recently-formed Securities Management Trust, a financial company organized under the auspices of the Bank of England to facilitate the rationalization of British industries, and it is stated that the first directors of the Wigan Coal Corp. Ltd. and the Lancashire Steel Corp. Ltd. will be selected by the Bank of England. The new steel corporation will have a capital of £5,750,000. The necessary application has been made to the court for the registration of the companies and meetings are to be held at the end of May for the shareholders to sanction the arrangement.

Firth & Sons Consider Amalgamation

At the same time there is another official report to the effect that the shareholders of John Brown & Co. Ltd. and Thos. Firth & Sons Ltd. will shortly be called together to consider a scheme of amalgamation. As has been stated above, these companies have certain common interests, and in particular the two concerns operate jointly the Brown-Firth Research Laboratories, Sheffield, which is a leading European metallurgical center.

It will thus be seen that while the geographical grouping on the Tees-side, in Scotland, and in South Wales tends toward the constitution of one large corporation in each district, the fourth geographical group in Yorkshire and Lancashire would be formed by a limited number of large concerns.

Temperature of Galvanizing Bath Affects Dross Production

Heat Distribution Assists Materially in Prolonging the Life of Kettle—Practice Differs in Commercial Plants

By Wallace G. Imhoff

President, Wallace G. Imhoff Co., Vineland, N. J.

GALVANIZER'S dross varies in character depending on the kind of material being zinc coated. Some dross is thin and slushy, some dry and sandy. It may have an almost white metallic appearance or may be blue and sandy. Drosses may settle quickly or they may float around in the metal bath and come out on the work as small specks or grains. Fig. 2 shows dross specks in the coating. The dross may come to the top of the bath and form a heavy crust over the surface.

Some important practical features affecting the character of the dross made are the size and shape of the galvanizing pot, method of heating the pot, heat distribution, temperature of the metal bath, the method of drossing the pot and the drossing equipment.

The size and shape of the galvanizing pot is determined largely by the character of the work being coated. The average sized pot for handling a large quantity of work is 12 feet long, 4 feet wide and 4 feet deep. The type of fuel employed for heating the kettle, whether it be coal, coke, gas, oil, or electricity, affects the furnace design, and in many instances the design and construction of the kettle. Both the fuel used and the furnace design affect the kind of dross made. In some cases the hottest part of the kettle is at the sides near the bottom; in others, at the middle of the sides; and in still others, at the top of the sides. These conditions are reflected in the character of the dross.

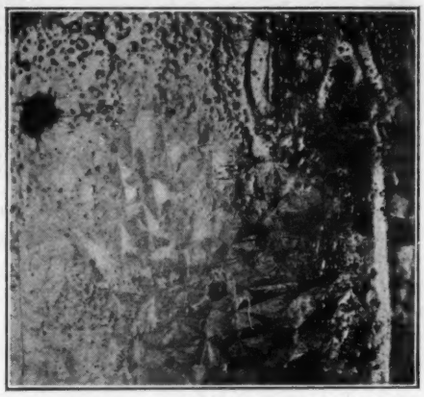


Fig. 2—Galvanized sheet showing dross specks on the coating

A high degree of heat in the bottom of the galvanizing kettle sweats the dross and makes it denser and usually causes the pot to fail somewhere at the dross line. In other instances, such as with coke-fired kettles, the hottest areas are those directly in front of the draft doors. The number of doors, and their size, therefore, is important.

The temperature range for galvanizing should be small. Zinc melts at 786 degrees Fahr. Yet it is not uncommon to find pots being operated between 1000 and 1100 degrees Fahr. with a dross production of 60 to 70 per cent. Dross made at 1000 degrees is different in character from dross made at 850 degrees Fahr., the average normal operating temperature for a large amount of material.

The drossing equipment has a drastic effect on the character of the dross. In many cases large amounts of good zinc have been sent to the dross pile because the drossing spoon was not made properly. The holes in the dross spoon should be of the proper size for the type of dross made. Dross should be removed carefully from the corners and the ends of the pots to insure long kettle life. A short pot life is due in many instances to dross accumulation being left in the corners and ends.

The density, or the specific gravity of dross is affected by the intensity and distribution of heat. These two factors vary according to the kind of fuel used, and the design and con-

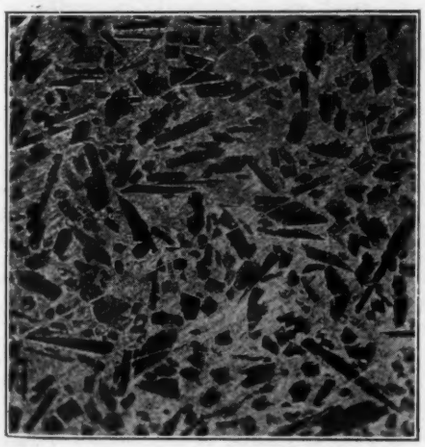


Fig. 1—Dross containing 2.79 per cent iron, known as wet dross. Its luster is white

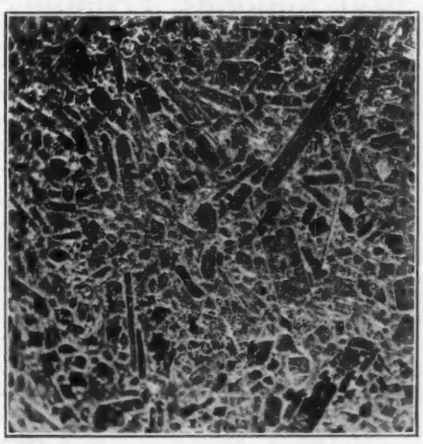


Fig. 3—Dross containing 3.86 per cent iron. Little metal exists between the crystals

struction of the furnace. Specific gravities of a few common brands of zinc used in galvanizing are 7.10, 7.00, 7.21, 7.38, 7.05, 7.02, 7.13 and 7.23. Dross crystals obey the regular laws of crystallization. Fig. 3 shows a sample of plant dross containing 2.79 per cent iron. This low-iron content is due to a large amount of good zinc having been sent into the dross by inefficient drossing methods, and drossing equipment. The etching shows the dross is composed of zinc iron alloy crystals and saturated metal between the crystals. The crystals are far apart, and in plant practice such dross is known as wet dross, and has a white metallic luster.

Fig. 3 shows a sample of dross from a sheet galvanizing plant. This dross contained 3.86 per cent iron. Comparison with Fig. 1 shows that as the iron content increases, the crystals are nested closer; little or no zinc metal is found between the crystals. The operating conditions, the drossing methods, drossing equipment, the furnace design and construction, and the type of fuel used, differ radically from that found in the plant where the dross shown in Fig. 1 was made.

Dross with an iron content of 4.28 per cent is shown in Fig. 4. The crystals are much larger and closer together than those in Fig. 3 and little metal is seen between the crystals. This dross is dry and sandy. As the temperature of the bath increases, the iron in the dross increases. At 820 degrees Fahr. the iron in a sample of dross was 2.61 while at 880 degrees Fahr. the iron in another sample of dross was 5.32 per cent.

The higher the temperature, therefore, the greater is the dross production, the higher is the iron content in the dross; and, the greater is the specific gravity of the dross.

1930 Simonds Economic Contest Announced

"Government interference with the free play of economic forces" is the subject of the Alvan T. Simonds ninth annual economic contest, founded and conducted by the head of the Simonds Saw & Steel Co., Fitchburg, Mass.

The first prize is $1000 and the second $500. The contest closes Dec. 31, 1930. Essays may vary in length, provided they are typewritten on one side of the paper and are accompanied by a summary, not exceeding 2500 words, which may be used as a separate magazine article.

An assumed name must be used, and the author's real name enclosed in a sealed envelope. All communications should be addressed to the Economic contest editor, Simonds Saw & Steel Co., 470 Main street, Fitchburg, Mass.

Scrap Dealers Discuss Trade Problems

Chapters of the Institute of Scrap Iron and Steel from New York, New Jersey, Reading and Philadelphia held a conference at Atlantic City, N. J., June 13, presided over by Benjamin Schwartz, director general of the institute.

The need of educating dealers and foundries in the proper classification and use of cast scrap, was discussed, and the advisability of an educational campaign in this connection was referred to the executive committee.

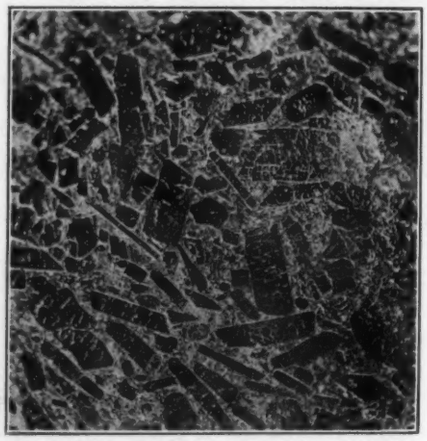


Fig. 4—Dross containing 4.28 per cent iron. Crystals are large and closely spaced

Other problems discussed included purchase of unprepared scrap by consumers and its effect on the scrap industry; reduction of freight rates between various points in Eastern Pennsylvania and New Jersey to the Pittsburgh markets; co-operative buying of acetylene and oxygen.

Dr. Hugh P. Baker, director of the trade association department of the Chamber of Commerce of the United States, outlined what a trade association can and cannot do under the law and analyzed the program of the institute in a constructive manner, paying tribute to the institute for its success.

Operates New Pipe Mill

Trial runs of the new 8 and 16-inch electric weld pipe mill at the Republic Iron & Steel Co., Youngstown, O., are said to have been successful and commercial operation of the mill is expected to began this week.

Lists Developments in Standardization

Important progress in standardization work affecting mechanical, electrical railways, mining and other American industries is reported in the American Standards year book for 1930. The standardization movement last year included the underwriting of $500,000 for national promotion work during the next three years, the affiliation of the association with national standardizing bodies of 20 other nations and an agreement between the association and the bureau of standards providing co-operation between government and private bodies in the promotion of industrial standardization.

The association has approved 166 national industrial standards and has 171 under way. Of interest to engineers is the new standards for symbols for hydraulics, aeronautics, electric quantities, etc. A copy of the yearbook may be obtained without cost by addressing the American Standards association, 29 West Thirty-ninth street, New York.

Flat Rolled Executives Study Markets

Fifty executives of the flat rolled steel industry convened at the Greenbrier hotel, White Sulphur Springs, W. Va., June 16 to 19 to study plans for extending the use and application of their product. Ralph Roosevelt, president, American Zinc institute, and vice president, Eagle Picher Lead Co., New York, in speaking at the opening session, mentioned that the zinc industry will devote all available funds to research to develop means for improving galvanizing methods and galvanized products.

An ultimate goal of 161,113,340 tons of steel was shown in a series of charts by the trade research division of the association at the morning session Tuesday. Francis P. Sisson, vice president, Guaranty Trust Co., New York, at the final session explained why the banker views cooperative market studies, trade researches and sales extension programs as necessary.

Road Adopts 5-Day Week

Atchison, Topeka & Santa Fe railroad has adopted a 5-day week for its shop employes at Topeka, Kans., and other points, in line with the railroad's retrenchment and as a substitute for further reduction in employes for the present, it is stated.

New Books Worth Reading

SCIENCE ECONOMICS BUSINESS

American Steelworks Listed

Iron and Steel Works Directory of the United States and Canada, 1930, issued by the American Iron and Steel institute, New York; 464 pages, 5¾ x 8½; published by the Institute and supplied by IRON TRADE REVIEW, Cleveland for $15, plus 15 cents for postage: in Europe by Penton Publishing Co. Ltd., Caxton House London for £3 15s, net.

In its twenty-first edition this directory, the authoritative listing of American iron and steelworks, follows the plan of a single alphabetic list, which has proven superior to the method used in early editions.

The twentieth edition was issued in 1926 and a large number of changes have been made in the interval, making the 1930 edition of great value to those requiring late information. Not only has this period been productive of great expansion of plant, but far reaching changes have been made by mergers and formation of new companies.

In addition to the main list, containing information about each company, lists are given of all blast furnaces, manufacturers of ferroalloys and pig iron in electric furnaces, manufacturers of ingots, of steel castings, rolling mill plants, and manufacturers of various lines of finished steel.

Historical connection is maintained by notes on companies not now operating, through retirement from activity or by merger with other companies. Active companies are distinguished by their names being carried in display type.

* * *

Technical Words Translated

Techno-Diktionar, by Hubert Hermanns; paper, 432 pages, 4½ x 6 inches; published by the author and supplied by IRON TRADE REVIEW for $3, plus 15 cents postage; in Europe by Penton Publishing Co., Ltd., Caxton House, London, for 15s, net.

In this pocket-size volume has been gathered a wealth of technical terms from metallurgical, foundry, factory and workshop practice. There are no definitions, but translations are given of the terms from English, German or Italian into the other two. The reader of technical material in either foreign language will find this of great aid as much of the material is outside the usual dictionaries.

* * *

Making Costs a Yardstick

Standard Costs, by G. Charter Harrison; cloth 308 pages, 5¾ x 8½ inches; published by the Ronald Press Co., New York, and supplied by IRON TRADE REVIEW for $5, plus 15 cents for postage; in Europe by Penton Publishing Co. Ltd., Caxton House, London, for 25s, net.

Coming from this author the information in this volume has more authority than usually accompanies economic publications. He has assisted materially in developing the methods of setting standard costs and has been a warm advocate of modern management methods. Exact details of the methods he has worked out are explained and practical procedure is given for setting standard costs in factory, shop and sales office, designing, installing and operating standard cost systems and other details of applying this means to any plant.

* * *

Handling Work in Production

Work Routing in Production, by John Younger, cloth, 115 pages, 5¾ x 8½ inches; published by the Ronald Press Co., New York, and supplied by IRON TRADE REVIEW for $2.50, plus 15 cents for postage; in Europe by Penton Publishing Co. Ltd., Caxton House, London, for 12s 6d, net.

The author is professor of industrial engineering at Ohio State university, Columbus, O. His book is a pioneer in dealing with the function of routing, scheduling and dispatching and is based on the current practice of leading manufacturers. Emphasis is laid on application of the methods to lower costs and widely varying conditions. Principles are explained and practical illustrations and examples show what results may be expected.

* * *

What Government Costs

Cost of Government in United States 1927-1928, cloth, 149 pages, 6 x 9 inches; published by the National Industrial Conference Board, Inc., New York; supplied by IRON TRADE REVIEW for $3, plus 15 cents for postage; in Europe by Penton Publishing Co. Ltd., Caxton House, London, for 15s, net.

Detailed factual information in previous publications of the board on this subject is brought up to date in this volume. It covers tax revenues and other fiscal operations of federal, state and local governmental units. Expenditures, indebtedness and tax burdens are analyzed, with emphasis on recent trends. For the first time in this series the proportions and actual amounts of state and local revenues from property taxes, licenses, permits and other tax sources are shown for each state.

* * *

Code of Electrical Engineering

Electrical Pocket Book, cloth, 386 pages, 4 x 6 inches; published by Emmott & Co. Ltd., London; supplied by IRON TRADE REVIEW for 50 cents plus 15 cents for postage; in Europe by Penton Publishing Co. Ltd., Caxton House, London, for 1s 6d, net.

New material has been included in this twenty-third annual issue. It relates to heavy electrical engineering. Former sections have been retained, those on lighting circuits and switching have been entirely revised and those on lamps and lighting have been rewritten and brought to date. Other new material has been added.

* * *

Inorganic Chemistry of Iron

Gmelins Handbuch Der Anorganischen Chemis, Eisen, Teil A-Lieferung, paper, three volumes 224, 88 and 312 pages, 6¾ x 10 inches, published by Verlag Chemie, Berlin, Germany, and supplied by IRON TRADE REVIEW, Cleveland, for $8.85, $4.25 and $12, respectively plus 15 cents postage on each.

This is the eighth edition of Gmelin's monumental work on inorganic chemistry. It deals with iron and is in three volumes. The first is divided into three parts, of which the first deals with the historical phases, in the form of a bibliography of literature on the subject. This is followed by a chapter on the occurrence of various forms of iron, and the location of

iron deposits in Europe, America, Asia, Africa, and Australia. The last chapter is devoted to pure iron, and includes data on its manufacture by electrolytic methods and by chemical means. It also describes special forms of pure iron and their properties.

The second volume is a continuation of section 1 of Part A. It deals with the physical properties of pure iron with data on its atomic structure, allotropic modifications crystallographic, mechanical, thermal, optical, magnetic and electrical properties. A section of the book is devoted to the electrochemical behavior of pure iron, and another section to its chemical behavior.

The third volume deals with the combinations of iron. The chapter on iron and the rare gases states that they do not diffuse through iron. The second discusses iron and hydrogen and includes data on iron hydride. The third covers iron and oxygen with divisions on the various types of oxides. The fourth describes iron and nitrogen with divisions on the various combinations of iron and nitrogen, ammonia, etc. The fifth deals with iron and flourine, and the sixth covers the numerous combinations of iron and chlorine.

* * *

A Man And A Business

Fellowship, A Biography, by Albert Field Gilmore, Litt. D.; cloth, 286 pages, 6 x 8¾ inches; published by the Stratford Co., Boston, and supplied by IRON TRADE REVIEW for $3.50, plus 15 cents for postage; in Europe by Penton Publishing Co. Ltd., Caxton House, London, for 17s 6d, net.

Fellowship as applied by Clarence H. Howard in his conduct of the Commonwealth Steel Co. is the theme of this volume. The Golden Rule practically applied furnishes the background. The biography deals with both the man and the business, which in a measure are inseparable. To students of the human side of industry this will furnish much of interest.

* * *

Popular Book Is Expanded

Lectures on Steel and Its Treatment, by John F. Keller cloth, 330 pages, 6 x 9 inches published by the American Society for Steel Treating, Cleveland, and supplied by IRON TRADE REVIEW, Cleveland, for $3.50, plus 15 cents postage; in Europe by Penton Publishing Co. Ltd., Caxton House, London, for 17s 6d, net.

So popular was the first edition of this book published in 1928 that the supply of 4000 copies was exhausted within two years. In preparing the second edition, therefore, advantage was taken of the opportunity to revise and rewrite the text completely. The author is steel specialist, engineering extension station, Purdue university, Lafayette, Ind., and the text matter comprises material used in a course of six lectures given before 80 groups in the state of Indiana and before some 27 groups in the country at large under auspices of the American Society for Steel Treating. These lectures have been presented to more than 10,000 persons.

Language in the text is simple and direct, complex technical discussions being avoided. Subjects in the order of presentation are as follows: Melting the steel and working the ingot; mechanical working of iron and steel; the iron-carbon diagram, annealing and cast iron; determination of critical points and physical testing; hardening, quenching, tempering and carburizing; warping, cracking and shrinking of steel. The second edition also includes a new chapter on alloy steels, cast steel and gas and electric welding. The text is illustrated profusely with 214 sketches, halftones and photomicrographs. The student or layman desirous of gaining a simple knowledge of steel and its heat treating and working characteristics will find this book most valuable.

* * *

How World Business Looks

Picture of World Economic Conditions at the Beginning of 1930, by the National Industrial Conference board, New York; cloth, 196 pages, 6 x 9 inches; published by the board and supplied by IRON TRADE REVIEW for $2.50, plus 15 cents for postage; in Europe by Penton Publishing Co. Ltd., Caxton House, London, for 12s 6d, net.

Three preceding volumes have been issued on the subject of world economic conditions at definite dates. In the present volume the first portion contains the annual report of the international chamber of commerce, surveying and analyzing characteristic problems in various countries. It also discusses economic conditions in the United States, the stock market crash, employment and wages, prices and cost of living and other factors.

The second portion presents 14 original articles contributed by foreign correspondents of the conference board, authorities eminently qualified to describe important developments in the economic life of their respective countries.

The North West chapter of the American Society for Steel Treating recently elected the following officers for 1930-31: Chairman, C. J. Graham, chief chemist, Northern Pacific Railway Co., Minneapolis; vice chairman, A. F. Moyer, chief engineer, Toro Mfg. Co., Minneapolis; and secretary-treasurer, Alexis Caswell, secretary, Manufacturer's Association of Minneapolis.

Mergers Afford Better Management

MERGERS and the consequent problems involved in the consolidation of two or more organizations were the principal topics of discussion at the production conference of the American Management association held in conjunction with the management division of the American Society of Mechanical Engineers, June 9-10, at Hotel Statler, Cleveland. The majority of the speakers considered their subjects not only with regard to individual business but also as to the effect of consolidations on overhead and production problems.

Thomas R. Jones, vice president and general manager, Harris-Seybold-Potter Co., Cleveland, speaking on "Post Merger Economies," stated that, "A highly legitimate purpose in consolidation is that of making available a quality of management not to be afforded by a smaller company." Other reasons for merging as outlined by Mr. Jones were: To effect internal economies in manufacture, distribution and administration; to eliminate bad merchandising conditions; to smooth sales and production variations, especially in business of highly seasonal character, for personal reasons, for example the ambition of executives to be big; pure promotional reasons, an example being stock-jobbing operations; and technical reasons.

Mr. Jones then went on to show why mergers do not necessarily bring economies. Some of the causes of loss coincident with mergers were stated as: A decided let-down in morale of the executives of the constituent companies, excess assets; new investment and moving expense; inadequate or top-heavy organizations; development expense necessary to the realization of engineering and manufacturing savings; the problem of excess personnel; and excess financial structure.

A consolidation to justify its existence should accomplish things which

were impossible to accomplish in the independent business of which it was constituted, he said. It must produce the same product at a lesser price, a better product at the same price or more stability in the industry, more profit for the investors, and greater advance in the industry.

Hand-to-Mouth Buying Dangerous

"The evils with which hand-to-mouth buying is accredited are three in number," stated W. S. Richardson, staff superintendent, mechanical division, B. F. Goodrich Rubber Co., Akron, O., in his talk on "Controlling the Cost of Planning." "First, it is charged with giving the overhead organzation more orders to handle for a given quantity of business Secondly, the required quick delivery time affects the rate of production. Unless the management thinks its way carefully through this situation it is faced with the cost of changing the rate of production frequently, with the attendant taking on and laying off of labor as the rate of buying surges up and down. Thirdly, the charge is made that the rapid changes in the rate of production reflect themselves into commodity buying and force purchases at unfavorable times."

William H. Bray, superintendent of methods and betterments, Automatic Electric Inc., in an address on "'Controlling Costs Incident to Maintaining Quality of Product," said, "The transfer of work from skilled or unskilled labor to automatic or semi-automatic machinery improves quality and reduces costs. There is usually a saving not only in time and total labor required, but also an increase in uniformity of the product.

"High wages, also unquestionably result in an improved product. When the policy of a company is to allow operators to earn good wages, the field for the selection of employes is broadened, and men and women of greater intelligence can be employed. A better product can usually be obtained as a result," said Mr. Bray.

Costs Must Be Known

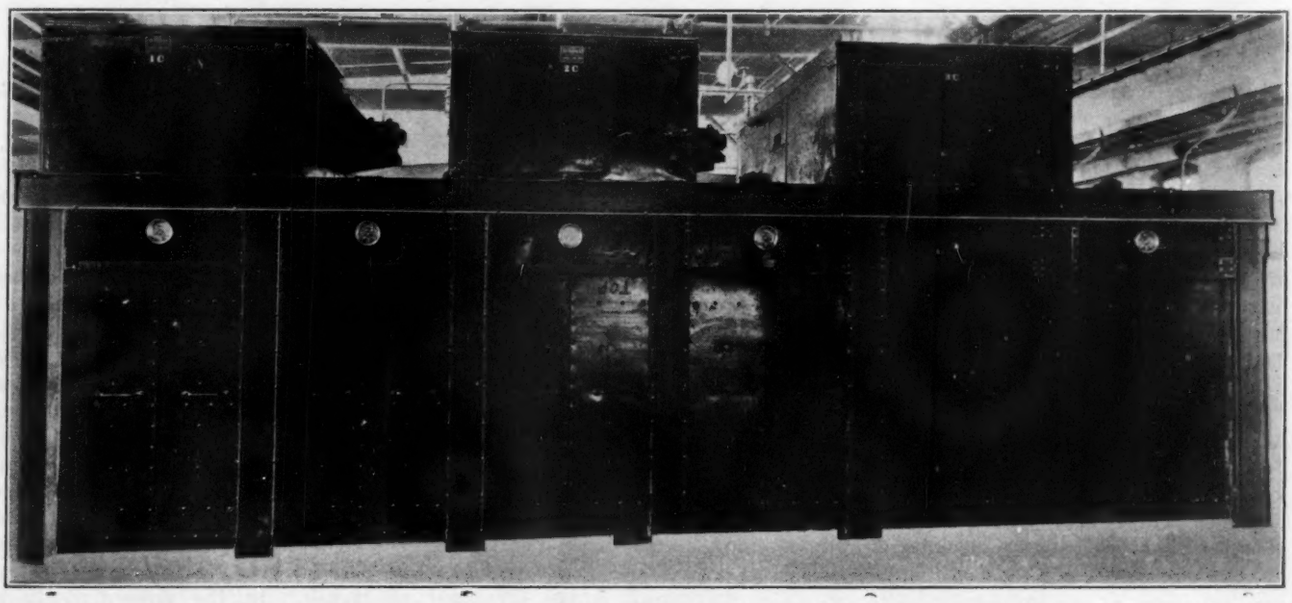
In an address on "Burden Trends in Modern Management," N. M. Perris, partner, Stevenson, Harrison & Jordan, Cleveland, said: "There is enough surplus capacity available in all industries that it is difficult for us to maintain our position and prices. We used to be able to work on a 40 per cent margin of profit where today we appreciate 5 per cent. We must therefore know our costs and control our activities so as to obtain the lowest costs possible."

Rod Baker Employs Novel Drying Method

HOT rolled rods have a coating of mill scale which must be removed by pickling before they are drawn into wire and following this pickling process the rods are lime coated (a wet process) to prevent rusting and to neutralize any trace of acid. During the cleaning process, the metal absorbs hydrogen which, unless removed by baking, will cause breakage of the rod in subsequent cold drawing. One of the latest type furnaces built for this purpose is known as the Cramer rod baker and this unit, developed by a large wire manufacturer and built by the Niagara Blower Co., New York, employs a method of heating which lends itself to exact temperature control and to economical operation.

The baker, shown in the accompanying illustration, is built with one or more insulated compartments, each equipped with its own heating element consisting of an enclosed steam coil and a fan so arranged as to recirculate the atmosphere over the steam coil and then return it to the compartment. Various temperatures are possible for different grades of steel by regulating the steam pressure and the speed of the fan.

Drying of the wet lime is accomplished in a minimum of time, the drying action being the result of rapid circulation of air which, above 212 degrees Fahr, absorbs a considerable amount of moisture. Heat transfer from the air to the material is accelerated because of the circulation and the material reaches the desired temperatures quickly, thereby speedily and uniformly removing the hydrogen. The acceleration of both the hydrogen removal and lime drying results in a large baker capacity for a given baker volume. The new method of baking and drying requires no attending labor and operating costs are confined to the cost of the steam and power for the fans.



Each compartment is equipped with a steam coil and fan for recirculating the atmosphere, thus affording uniform temperature

Engineers Review Industries in Semiannual Meeting

American Society of Mechanical Engineers Convenes in Detroit, June 9-12, 700 Attending

Machine Shop Practice Division and Management Group Discussions High Spots in Program

ALTHOUGH attendance was held down somewhat by current business conditions and other factors, the semiannual meeting of the American Society of Mechanical Engineers, held at Book-Cadillac hotel, Detroit, June 9-12, was characterized by interesting technical programs, discussions, inspection trips and entertainment. Two sessions on machine shop practice attracted a large group from the 700 members and guests registered for the meeting. Advances made in the application of cemented tungsten carbide were brought out at a symposium conducted under the auspices of the machine shop practice division of the society Monday afternoon. E. F. DuBrul, general manager, National Machine Tool Builders' association, Cincinnati, presented the introductory address at this symposium and reiterated his sentiments in favor of the establishment of a research fund by machine tool builders and users for organized effort in the solution of the problems of machine design and operation which are presented by cemented tungsten carbide tools. A technical session provoking considerable discussion was held Wednesday morning under auspices of the management division, with the American Management association co-operating. Management problems in the small and large plant were discussed in two papers.

Inspection trips were scheduled to a number of plants in the Detroit district. An aeronautical show was held for visitors Thursday afternoon at Grosse Isle airport.

A proposed amendment to the constitution of the society relating to an increase in initiation fees was given its first reading at a business meeting Monday afternoon. Meetings of various other committees and subcommittees on subjects of research and standardization also were held throughout the week. A meeting of the nominating committee was held Tuesday and nominations for officers of the society for 1931 are shown in an accompanying box. Election will be by mail ballot.

Symposium Shows Progress in Tungsten Carbide

FINISHING cylindrical bores by means of an expanding grinder or by the so-called honing method was outlined in a paper, "Refinements in Finishing Cylindrical Bores," by J. W. Hindes and James G. Young, both of the Hutto Engineering Co., Detroit. The paper was presented by Mr. Hindes and was the first subject of the opening session dealing with machine shop practice Monday morning. A. N. Goddard, president, Goddard & Goddard, Detroit, was chairman and about 40 attended.

Limitations of boring, reaming, burnishing and broaching as finishing operations on cylindrical bores have led to the general use of abrasives for such work. The honing method of finishing bores has the advantages of speed, improved accuracy and finish and low costs, at the same time making possible precision grinding of long tubes, gun barrel rifling, and bores with ports, keyways and relieved portions. The grinding mechanism consists usually of an expanding segmental wheel made up of a series of abrasive stones placed longitudinally upon the surface of a metal body with an adjusting means for expanding the stones to the walls of the cylinder being ground and for holding them under pressure against the wall, the tool itself being reciprocated and rotated simultaneously.

Discussion which followed centered about comparison of honing with other types of finishing bores such as broaching, rolling, etc. Mr. Goddard inquired about tolerances employed with the method and Mr. Young, coauthor of the paper, who replied to all questions brought up in the discussion, stated that tolerances were kept at about 0.0001-inch in the diameter. Andrew Slovak, National Automatic Tool Co., Detroit, questioned the authors about how the method compared with rolling. Mr. Young declared that although rolling possessed the advantage of speed, the accuracy was not nearly as great. Mr. Young, in elaborating on on the process, pointed out that it was applicable to sizes up to 16-inch diameter and 65 feet long and was accomplished horizontally. The best lubricant for use in the work is kerosene in large quantities.

Description of a detailed study made of what happens when metal is cut was presented by O. W. Boston, professor of shop practice and director of engineering shops, University of Michigan, Ann Arbor, Mich. This investigation was a continuation of previous work which Prof. Boston has undertaken relating to the machining of metals. In the present study a planer was set up and a microscope and plate camera focused on the cutting

tool. Cutting speeds were slow, the planer being driven by turning the pulley by hand. The tool was set at various front rake angles and various depths of cut were taken of the order of 0.010-inch.

The first experiment was made with cast aluminum. At various positions during the cut the planer was stopped and a picture taken, revealing the formation of the chip and the action of the tool in shearing or cutting away the stock. It was found that the cutting action was not by the tool edge but by a built-up nose on the tool of the metal being cut. An English authority has suggested that this nose is composed of some of the metal welded to the tool by the heat involved in the operation but Prof. Boston claims that not sufficient heat is involved to justify a welding temperature and that the built-up nose merely adheres to the tool.

Many Metals Were Examined

Various other metals were examined in the same way—leaded and non-leaded brass, cast iron, and screw stock steel. In some cases the chips formed were found to be a series of small laminations in which definite lines of shear were visible; however, in the case of cast iron no regularity was observed, the material breaking up irregularly with no shear lines visible. An increase in the front rake angle of the tool was found to reduce the power required but if this angle is beyond 30 degrees the tool life becomes much shorter. Another interesting discovery was that the tool does not actually cut the depth it is set but cuts slightly more or less, depending upon the angle at which it is set. The depth cut equals the depth set when the tool has a front rake of 15 degrees. Prof. Boston's remarks were illustrated by lantern slides made from plates taken during the planer tests on the various metals.

Echoing previous sentiments urging the establishment of a sizable research fund for the study of machine tools, especially in connection with the new cemented tungsten carbide tools, E. F. DuBrul general manager, National Machine Tool Builders' association, Cincinnati, stressed the need for developing machine tools beyond the ability of cutting tools in the introductory address at the afternoon session on machine shop practice. Approximately 85 attended this session, a symposium on cemented tungsten carbide, presided over by C. W. Spicer, vice president and chief engineer, Spicer Mfg. Corp., South Plainfield, N. J.

Mr. DuBrul deplored the disorganized state in which this type of research is found at present, and also the duplication and waste of effort which is so largely present. He saw as a possibility the use of laboratories of state universities in the solution of problems confronting machine tool builders and users, but was firm in the belief that companies should supervise the work and should advance a considerable sum of money to assist the financing arrangements.

In connection with designing machines for use with tungsten carbide tools, Mr. DuBrul suggested that some designer go to work on a design which would be entirely radical in every feature, so much so in fact that, as he said, it might be laughable to many. Then the procedure would be to test this machine with the new tools to determine whether its capabilities were beyond the tool or whether as at present the ability of the tool is limited by the machine. Prof. M. C. Stewart, Lehigh university, Bethlehem, Pa., heartily in accord with Mr. DuBrul, declared that a section of the spacious new research laboratories at that university is devoted to research in machine tools and that co-operation along any suggested line would be offered gladly.

Officers Nominated

AMERICAN SOCIETY OF MECHANICAL ENGINEERS

President

ROY V. WRIGHT
Managing editor, *Railway Age*, New York

Vice Presidents

WILLIAM A. HANLEY
Chief engineer, Eli Lilly Co., Indianapolis

THOMAS R. WEYMOUTH
President, Oklahoma Natural Gas Corp., Tulsa, Okla.

HARVEY N. DAVIS
President, Stevens Institute of Technology, Hoboken, N. J.

Managers

W. L. BATT
President, SKF Industries Inc., New York

H. L. DOOLITTLE
Chief designing engineer, Southern California Edison Co., Los Angeles

H. L. WHITTEMORE
Chief, engineering mechanics section, bureau of standards, Washington

A number of cutting tests with cemented tungsten carbide lathe tools were described in a paper by T. G. Digges, associate metallurgist, bureau of standards, Washington, in whose absence the material was presented by his former co-worker, H. J. French, now with the International Nickel Co., Bayonne, N. J. Mr. French explained that the work was done primarily to determine whether tungsten carbide tools will follow the general laws of cutting already established. Lathe breakdown tests were conducted on a 36-inch lathe with a single-pointed cutting tool similar in form to that commonly employed for heavy-duty roughing work. Dry cutting was used throughout the tests. Characteristics of the cutting speed-tool life curves were similar to those of high-speed tools and among other conclusions reached by the author was one often heard in this connection, that machines capable of operating at high speeds with powerful driving units are necessary to utilize the full cutting capacity of cemented tungsten carbide tools.

G. N. Sieger, technical assistant to the president, Carboloy Co. Inc., New York, in discussing the paper, pointed out the importance of tool shank form in obtaining most efficiency from the tool, mentioning an instance where an L-shaped tool gave perfect results compared with a straight tool which failed immediately.

Tip Size Importance Stressed

Importance of the size of the tip of the tool was pointed out by Roger D. Prosser, Thos. Prosser & Son, New York, representatives of the Krupp interests in Germany, who suggested that further tests along the lines of Mr. Digges' paper, but varying the sizes of the tungsten carbide tips used in the tools, would be valuable.

Application of cemented tungsten carbide to metal cutting saws was the subject of a paper by C. M. Thompson, products engineer, Henry Disston & Sons, Philadelphia, who, in the course of his paper, outlined the history of the circular metal cutting saw, from the first solid type, the inserted tooth type with teeth of high-speed steel and finally with teeth of cemented tungsten carbide. In the construction of the latter a recent innovation in circular saws, detailed information must be assembled on the position of the saw with relation to the work, speeds and feeds. High speeds are possible, some attaining 15,000 feet per minute at the teeth, amounting to about 3800 revolutions per minute with a 16-inch diameter saw. Mr. Thompson described and illustrated with slides a number of tests made by his company on circular saws having inserted tungsten carbide teeth.

An instance was cited of cutting a larger armor plate forging, 10 inches thick and weighing 88,000 pounds. Attempts were made to cut the forging with a 48-inch saw having high-speed steel inserted teeth but it was impossible to force the blade through the material, with a speed of only 1 revolution per minute; cemented tungsten carbide teeth were inserted and the material cut at 3 revolutions per

minute. The cost of a saw employing the carbide teeth was estimated at 17 times the cost of the high-speed steel type. No figures were in Mr. Thompson's possession to permit comparing increased costs with saving in resulting from increased production and less down time.

Results with the use of tungsten carbide as a cutting material on heavy machine tools were detailed and discussed by Coleman Sellers III, executive engineer, Wm. Sellers & Co. Inc., Philadelphia. Four major advantages of these new tools were found from use in the Sellers company plant—increase in metal removed due to increased speeds; sand and scale cut readily; hard castings were saved and machined; and the edge of the tool was retained over the entire length of even a long cut.

Concluding the afternoon's program was the detailed report of the subcommittee on tungsten carbide cutting materials of the American Society of Mechanical Engineers special research committee on the cutting of metals. This committee, with the assistance of the National Machine Tool Builders' association, previously had sent over 600 letters and questionnaires to builders and users of machine tools requesting information on experiences with the use of tungsten carbide. The report consisted of a digest of replies received and threw much light on progress being made with the new cutting material. Portions of this report are presented on Page 73 of this issue of IRON TRADE REVIEW.

Effects of temperature on the properties of metals came in for some discussion at a session on the properties of metals. An outstanding paper at this session was titled. "Flow Characteristics of Special Iron-Nickel-Chromium Alloys and Some Steels at Elevated Temperatures," by H. J. French, William Kahlbaum and A. A. Peterson, respectively, International Nickel Co., Bayonne, N. J.; Midvale Co., Philadelphia; and General Motors Corp., Detroit.

Small Plant Management Has Many Advantages

MANAGEMENT problems in both large and small plants were considered at a session held Wednesday morning under auspices of the management division of the society, with the American Management association co-operating. R. H. Langsburg, vice president, First National bank, Detroit, presided, and a large number of the 25 present took active part in discussing the management side of all types of business.

The responsibility of management for industrial casualties was emphatically asserted by George Opp, Detroit Edison Co., in a short address on safety. Mr. Opp declared that any program of industrial safety required for its success, sincerity, aggressiveness, fair-mindedness, enthusiasm, thoroughness and whole-hearted co-operation on the part of the management.

Small Plants Discussed

Characteristics and advantages of the management of a small manufacturing plant were discussed by Crosby Field, vice president, Brillo Mfg. Co. Inc., Brooklyn, N. Y., who pointed out that the success of a plant depends on its attaining and maintaining what he termed a certain "degree of uniquity" in regard to products, market, price or some other feature. The small plant, employing under 250 men, is better able to do this according to Mr. Field.

Management from the angle of the large plant was considered in a paper, "Management of the Large Manufacturing Plant—How To Retain the Advantages of the Small Plant," by A. B. Reynders, works manager, Westinghouse Electric & Mfg. Co., Springfield, Mass. Mr. Reynders declared that the success of the small plant is dependent almost entirely upon personnel; hence, the selection of proper men in the large plant is of utmost importance. A large plant has the advantage of quantity production and can obtain also the advantages of the small plant by careful attention to details. The advantages usually considered as resulting from a small plant are quick action, low production cost of small quantities, and close relationship of employe and employer. Mr. Reynders outlined in his paper methods for obtaining these advantages in the large plant. Cost accounting and cost reduction departments are important units of any successful large plant, according to Mr. Reynders.

Concluding the formal program was a brief address by Prof. Fairfield E. Raymond, department of economics, Massachusetts Institute of Technology, Cambridge, Mass., speaking on the latest developments in the research on economic lot sizes. Prof. Raymond stated that production at minimum cost is not always practical; economic utilization of capital being an important factor in the administration of any business.

Much enlightening discussion was stimulated in this session, mergers, unemployment and other topics of the day being introduced. E. J. Kearney, Kearney & Trecker Corp., Milwaukee, Wis., was of the opinion that the large plant has infinitely more power due to its resources for continuing management in the face of any temporary disorganizing influence. Mr. Kearney also recommended to the management division a study of the unemployment and laying-off problem which he termed a "serious detriment to society."

W. J. Barratt, industrial engineer, Metropolitan Life Insurance Co., New York, told of an instance where a combination of the large and small plant idea was established successfully. This was in the case of a shoe manufacturer where six plants were maintained, each employing 300 men. The value of professional management was emphasized by K. W. Stillman, products editor, *Business Week*, New York, who showed how small plants often were family propositions and the management handed down from generation to generation.

As might be expected the question of mergers arose and their connection with management problems was demonstrated by H. V. Coes, manager of industrial management, Ford, Bacon & Davis, New York. He contended that mergers often fail due to humanitarian reasons and not solely due to financial troubles. One of the chief dangers of any merger or consolidation, in Mr. Coes' opinion, is the "scrapping of experienced aides."

Gear Manufacturers Plan Semiannual Meeting

The American Gear Manufacturers association will hold its fall semiannual meeting Sept. 29-Oct. 1 at Hotel Clifton, Niagara Falls, Ontario, at which time an appropriate program of technical papers, discussion, and consideration of business problems will be presented. A. A. Ross, General Electric Co., West Lynn, Mass., has been elected chairman of the general standardization committee of the association to succeed B. F. Waterman, Brown & Sharpe Mfg. Co., Providence, R. I., who recently was elected president of the association. Mr. Ross has been active in standardization affairs.

Users of Tungsten Carbide Report Variety of Experiences

Replies to Questionnaire Reveal Application of New Tool Material to Production Machining Is Still Limited in Extent

By Frank C. Spencer

Assistant Superintendent, Machinery Procurement, Western Electric Co.

REPLIES to questionnaires seeking information on experiences with the use of cemented tungsten carbide as a cutting material show that a relatively small average number of machining operations is now being performed regularly using tungsten carbide tools, although in two companies reporting the number of applications is over 500 in each. Probably a better indication of the extent of application is the low percentage of the number of tungsten carbide tools to the total number of tools available. This is considerably less than 1 per cent; but there are, however, several notable exceptions—one machine tool builder reports 5 per cent, one 15 per cent and another 25 per cent. One company is using tungsten carbide tools for 75 per cent of all cast iron turning.

Enlargement Programs Contemplated

While the total volume of production now being obtained with the use of tungsten carbide tools is still relatively small, the replies indicate that practically all of the companies reporting have definite programs planned which contemplate the more extensive use of tungsten carbide provided that "tests which are now being conducted prove to be satisfactory."

One company is planning to equip 1000 machines with tungsten carbide tools for the general machining of metals, and another is conducting a test which, if it "shows that a saving can be effected, will result in their use exclusively on all cast iron, semi-steel, bronze and brass machining," with the possibility of extending the application for machining 1000 different parts.

Experiences indicate that tungsten carbide is superior to tool or high-speed steel as a cutting material on all nonferrous metals regardless of the hardness or the condition of the surface, especially for roughing cuts on production jobs. Not all replies are agreed, however, that finishing can be done as satisfactorily as with high carbon or high speed steel tools.

Cast iron submits readily to the tungsten carbide tools even when the surface has a hard sandy scale. One company reports, "We have to cut through chaplets and welds where blow holes have been acetylene welded. Tungsten carbide does not seem to fail in cutting through these defects."

A difference of opinion exists as to the advantage of using tungsten carbide tools in machining steel. Several report failures in attempts to improve on high-speed steel performances, while others are enthusiastic about the use of tungsten carbide for machining steel and report having readily machined alloy steels which could not be machined economically with high-speed steel. One company reports machining a hand forged nickel chromium steel aeroplane propeller shaft, stating:

"It was extremely tough and irregular in shape, necessitating in frequent instances materially heavier cuts on one side than on the other. Scale conditions and hard spots were particularly difficult. The shaft was turned on a turret lathe about 10 years old but in good condition. The job was completed successfully using tungsten carbide tools, as we found it absolutely impossible to finish the machining of the parts using high-speed steel tools without first annealing the forgings, and then only with great difficulty."

Standard Machines Equipped

Machines on which tungsten carbide tools have been used successfully on regular production include practically all standard types of metal cutting machines, except milling and drilling machines which, replies indicate, have been equipped with tungsten carbide tools for use principally on an experimental basis.

Practically all of the tools used by the companies reporting were lathe or planer type tools in a large variety of shapes and sizes, some having shanks as large as 2 x 2½ inches. Tips in most cases were simply brazed, though a few were inserted and in one or two cases they were dovetailed and brazed. The rake and clearance angles in most cases were those recommended by the suppliers but in some instances customers found modifications of these angles desirable on certain kinds of work.

Tool grinding was done mostly by

Committee Report Made

WITH the assistance of the National Machine Tool Builders' association the subcommittee on tungsten carbide cutting materials of the American Society of Mechanical Engineers special research committee on the cutting of metals recently sent out letters and questionnaires to over 600 users and builders of machine tools requesting specific information on experiences with tungsten carbide as a cutting material. About 75 replies have been received to date and of these, 50 furnished the requested data. The accompanying article is a digest of these 50 replies and is taken from the subcommittee's report made at the semiannual meeting of the American Society of Mechanical Engineers at Detroit, June 9-12. The author, Frank C. Spencer, assistant superintendent, machinery procurement, Western Electric Co. Inc., Kearny, N. J., is chairman of the society's subcommittee.

hand; a few companies reported using cutter grinder machines also, and some have grinding done by the suppliers. One company reports grinding "not essentially different from standard tool dressing methods"; another "tools were ground in our tool room by one man who was instructed as to proper methods."

A gear company, cutting cast iron, brass and bronze castings reported that the time consumed in grinding was from 1 to 3 hours, according to the condition of the tool. Another stated that twice the time was required as for grinding high-speed steel tools, while another, machining bronze, reported 3 to 5 minutes as the average time required. A shop doing heavy work stated that "after original grinding, only a few minutes each day is required for occasionally touching up cutting edge."

Apparently the practice of grinding tungsten carbide tools differs as greatly as the grinding of tool steel and high-speed steel tools. The importance of maintaining the correct rake and clearance angles on tools used for production work which can only be accomplished by machine grinding seems to be generally disregarded.

Lapped or Stoned Tools Used

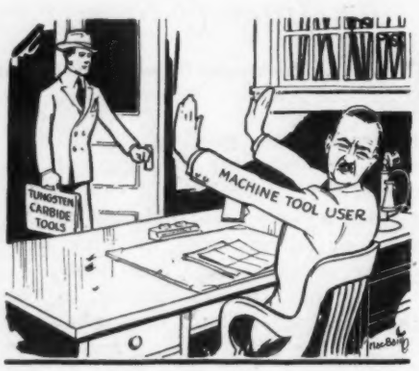
Of 40 companies, 11 reported the use of tungsten carbide tools lapped or stoned. The lapping has been done mostly by hand using a cast iron lap though in a few cases disk lapping machines are used, silicon carbide or diamond dust with oil being used as an abrasive. The advantage of lapping tungsten carbide tools is questionable.

Increases in cutting speeds, using tungsten carbide tools in cutting cast iron and nonferrous metals, have been from two to three times the cutting speeds using high speed steel tools. Many are using the highest speed that the machines will permit. One report stated relative to cutting bronze, "We have made several tests of cutting speeds and have got as high as 400 feet per minute, but could not maintain this due to the construction of our machine tools."

General practice seems to be to use about the same feeds and depth of cut in cutting with tungsten carbide tools as with high-speed steel tools. No radical differences have been reported. A tendency is indicated however, toward lighter feeds with much higher cutting speeds than are used with steel tools.

Some remarkable increases in outputs per grind using tungsten carbide tools for machining cast iron and nonferrous metals have been reported, as compared with high-speed steel tools. A company machining silicon-aluminum alloys reported that with the use of tungsten carbide tools, production was 4500 to 35,000 pieces per grind, whereas with the use of high-speed steel tools, production was 100 to 1800 pieces per grind. An airplane company in turning aluminum bronze obtained 2000 pieces per grind using tungsten carbide, against 60 pieces per grind using high-steel, and in boring aluminum alloy crankcases having 8 bearings each, 50 to 75 crankcases per grind using tungsten carbide against one using high-speed steel.

A company machining cast iron reported 1500 pieces per grind using tungsten carbide against 100 using high-speed steel. Another company machining cast iron reports the number of pieces per grind using tungsten carbide is 1500 per cent over the number using high-speed steel, and the increase in the number of grinds in the life of the tool "due to the small amount removed in grinding would be about 200 per cent."



Attitude of machine tool user before trying tungsten carbide

A valve company machining nonferrous metals reported as follows:

"As compared with high-speed steel one particular job shows an increase of approximately 2400 per cent in pieces per grind and an increase of approximately 560 per cent on the number of grinds per tool. On another operation where tungsten carbide tools replaced high-speed steel, the number of pieces per grind increased something like 1600 per cent."

Larger Runs Are Possible

Longer runs, without the necessity of shutting down for tool grinding, result in an appreciable increase in machining production efficiency, without the necessity for spectacular increases in cutting speeds. Large economies are effected with the use of tungsten carbide on such operations even when used on equipment that was not designed for the severe service tungsten carbide will withstand.

Considering the gain in production resulting from long uninterrupted runs combined with the gain resulting from the high cutting speeds obtainable with this material, the possibilities of cost reduction are considerable.

A few companies reported no failures whatever, although most of the companies including those which have been able to expect satisfactory savings using tungsten carbide tools, have had several discouraging experiences, some due to unsatisfactory tools and some to machine deficiencies, and some no doubt to unfamiliarity with the technique involved in the use of the material.

With respect to tool troubles, one large company stated:

"We have had setups which gave us considerable trouble, and which finally worked out only after a new set of tools was installed by changing suppliers. We believe that tungsten carbide is inconsistent in hardness and grain structure and that the tipping is not always satisfactory which generally causes failure of a setup."

One large company's report summed up the statements of several:

Failures Are Experienced

"Have had the usual failures experienced by others such as those due to tools having too great overhang; to making intermittent cuts; to operator stopping machines and starting again with feed on; to operator running machine in reverse accidently; to not exercising care when tool leaves the work, and when blow holes are encountered."

Quoting from reports of other companies:

"We could only increase speed a little before we reached the maximum speed of machine and when we attempted to increase the feed the tips came off."

* * *

"The only failures we have had were when the tool had to be stopped in the cut. Sudden shocks break tungsten carbide tools."

* * *

"Setup called for three roughing tools at one time. It was necessary to remove one tool for lack of power after the belt and clutch were tightened as much as possible without injury to the machine."

* * *

"On the full automatic lathe, the tools were used in conjunction with a follow-rest and the work was driven by means of serrated dogs. Any slight slipping of the work or misalignment of it while being inserted or ejected from between centers chipped the cutting edge and it seemed almost impossible to get a full run from a tool."

* * *

"The machining of malleable iron and brass wedge gate valve disks had been unsuccessful owing to considerable vibration when running at the proper speed. Although the floor under the machine was strengthened and an entirely new machine installed, considerable vibration still existed and resulted in chatter."

* * *

"Tried tungsten carbide and found

that the first requirement of their successful use is rigidity of the machine tool. Since we have practically no machines in our plant rigid enough for the use of these tools we abandoned further experiments."

Practically all experiences reported indicate that tungsten carbide possesses possibilities for the improvement of machining practices far beyond those already attained, providing further improvement is made in the material, and in the tools and machines to withstand the more severe service to which they will be subjected. But much is still to be done, especially in the design of machines and a consideration of some of the suggestions which have been submitted for their improvement would not be amiss. The suggestions are as follows:

1. Utmost rigidity of the frame, driving shaft and spindle, tailstocks or other members subject to strain is essential in order that deflections shall be extremely small.
2. Large capacity ball bearings, preferably preloaded or adjustable roller bearings of precision quality should be used for spindles to withstand heavy loads and to eliminate bearing clearances or reduce them to a minimum.

Higher Speeds Are Necessary

3. Considerably higher speeds are obviously necessary.
4. Greater power should be provided with a large allowance for overload so that machine will not stall when cutting.
5. It is important that feeding mechanisms be designed to eliminate jumping due to the building up and sudden release of pressures on tools.
6. Tool holders should be heavier and designed to eliminate the overhang of tools and the method of clamping tools in holders should be improved to insure rigidity.
7. Better provision for handling chips and protection of operators from flying chips should be made.

Replies received contain much valuable information and many terse comments pertinent to the subject of tungsten carbide applications and this report would be incomplete without the inclusion of some of them. The following are typical:

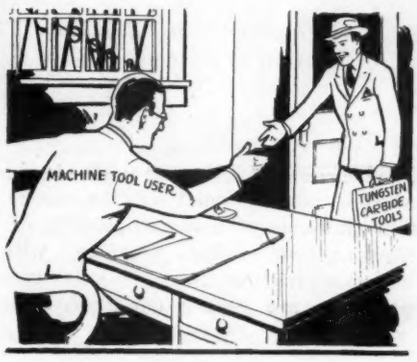
"After the operators become familiar with the possibilities of tungsten carbide tools, they are reluctant to go back again to high speed steel."

* * *

"Tungsten carbide tools have not progressed beyond experimental stages, though we have been working with the material ever since its introduction. We have not found it satisfactory as a cutting medium in our production work, where we are called upon to machine high carbon chrome steel forgings annealed to a brinell hardness of 170. In all trials of tungsten carbide tools on this material, it has proven less satisfactory than cobalt high speed steels.

"We note an interesting condition in the use of tungsten carbide tools on either high carbon chrome or low carbon steels, namely, that if we introduced the tool into the work carefully, a continuous cut could be taken at high surface speed and corresponding coarse feed, without any detriment to the tool so long as the tool was not removed from the cut; but when the tool was removed, a small piece of the cutting edge remained in the work. This was demonstrated any number of times and so far we have found no way of overcoming this difficulty.

"In general, we believe that standard machines made within the last three or four years are sufficiently powerful and have the necessary speed range to use tungsten carbide on



Attitude of machine tool user after trying tungsten carbide

work to which it is adapted. We have every confidence in the possibility for increased production and savings in the cost of machine operations by the careful application of this material."

* * *

"Generally speaking, we have found it impractical to adopt tungsten carbide as a cutting material for general use in our shop. While greatly increased speeds and feeds are possible on certain jobs, the overall saving on most of our work does not justify the high cost and frequent breakage of the tools.

"On the other hand, we have found tungsten carbide to be useful in cases where we have had to machine hard or abrasive materials such as chilled cast iron, hardened steel, hard bronze, sandy steel castings or other materials which high-speed steel tools would not cut at ordinary speeds. In such cases, the time saved seems to justify the high cost of the tools. For the machining of soft materials such as cold-rolled steel and gray cast iron in small or medium sized quantities, the present cost of tungsten carbide seems entirely too high to make it commercially practical."

Use Is Limited

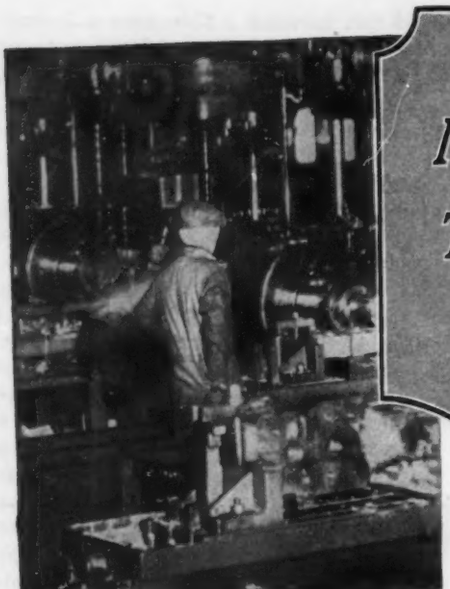
Tungsten carbide tools have been on the market for about a year and a half but their use on production work is limited as yet. A year ago it was thought that the development of tungsten carbide with respect to material and tools would progress much more rapidly than improvements would be made in adapting machines to the use of this material. This does not seem to have been the case. Improvements in the quality of the material, and in the efficiency of the tools and machines, seem to be advancing together. The improvement of the machines, however, is a large undertaking and we may expect important changes in design for some time to come. However, a large amount of evidence indicates that for certain classes of work, tungsten carbide tools can be used with considerable economy on old style machines provided they are in good condition. These tools are being experimented with by a large number of machine tool users in an endeavor to adapt them to present machine setups. We need not expect that the transition from the use of old style machine equipment to the use of highly developed machine equipment due to the more general adoption of tungsten carbide tools will be unduly rapid.

The technique involved in the use of tungsten carbide tools is quite different from that involved in the use of steel tools and it will take some time to train shop people in the proper methods of handling, grinding and setting up tools and machines. The development of this technique is rather expensive but if the initial applications are made where appreciable saving can be effected, the cost of further and more difficult applications will be compensated for, at least to some extent.

New Officers Chosen by Cleveland Engineers

Warner Seely, secretary, Warner & Swasey Co., Cleveland, was elected president of the Cleveland Engineering society for 1930-31 at the annual meeting of the executive board held June 7. Mr. Seely was vice president of the society last year. Other officers elected were: Vice president, Orin C. Sabin, secretary, Sabin Machine Co.; treasurer, Hugh Cook, vice president, Lundoff-Bicknell Co.; secretary and manager, Carlton R. Sabin, Carnegie Hall, Cleveland; and librarian, Gilbert O. Ward, head, technology division, Cleveland public library. Three new directors were elected to fill vacancies in the present board as follows. Ralph L. Harding, Wilbur Watson & Associates; G. Otis Wright, Roberts & Wright; and George F. Burrows, architectural engineer.

Manufacturing operations now are fully under way in the new $350,000 Michigan City, Ind., plant, housing the pump and unit heater divisions of the C. A. Dunham Co.



New Machine Tools and Shop Equipment

"There is always work and tools to work withal, for those who will."
—Lowell

Light Weight Features Welding Machine

No. 183

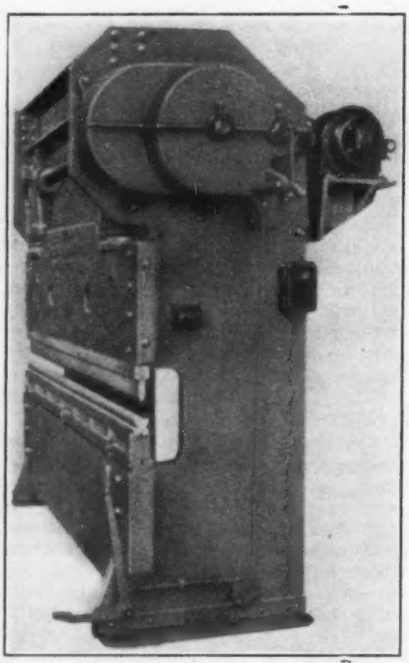
Micro Products Co., Peoria, Ill., is announcing a heavy-duty welding machine to weld stock of all shapes, ¼ to ⅝-inch size. This new butt welder weighs only 100 pounds and can be equipped with separate annealing dies if it is to be used to anneal high-carbon stock. Clamps and dies are specially designed for the work; the top part pivots to insure tight closing on the rod which is placed in the proper V-groove in the die. Tungsten contacts that will not burn or char are provided for the operating switch. The heat switch allows the use of three different heats according to the size stock to be welded.

The machine is equipped with two handles that control the clamps and enable the operator to set quickly the two rods to be welded. There is also a spacing lever for rapid adjustment of the space between the two ends to be welded. An index barrel enables the operator quickly and accurately to secure the proper spring tension for any size stock.

Press Brake Is Adjusted Quickly and Easily

No. 184

Long & Allstatter Co., Hamilton, O., is producing a new steel power press brake, which may be equipped with dies to do practically all types of work required of the machine. A large friction brake is incorporated in the machine, shown in the accompanying illustration. Operation by the friction clutch foot and hand levers enables the slide to be stopped at any point of the stroke. The clutch is of the multiple-disk design, plates being provided with asbestos friction lining. Low unit pressures are needed on these disks to do the work required and the adjustment is simple.



No. 184—Steel press brake can be equipped with dies for a wide range of work

Adjustment for the slide is by small individual high-torque motor through worms and wheels. A pointer and graduated scale on the right-hand connection indicate the position of the adjustment. The worms are provided with ball thrust bearings. The flywheel shaft is of alloy steel, hardened and mounted in roller bearings, while the intermediate shaft operates in bronze-lined bearings. The eccentric shaft is made from a 0.40 to 0.50 per cent carbon steel forging 4 inches in diameter and has large bearings on both sides of each eccentric.

Dust-Tight Pillow Boxes Fit All Shafting

No. 185

Link-Belt Co., Chicago, is announcing a new roller bearing, antifriction, ball and socket pillow block, designed several years ago and tested in every type of service. These pillow blocks are designed to fit any good grade of commercial shafting, from 1 7/8-inch diameter to the largest size, without special fittings or the use of appliances. Because the blocks use pressure lubrication, they are practically dust tight. Grease is forced in at the center and out at the shaft openings; thus, with the addition of the grease seal at the top, dust and dirt are kept out of the bearing.

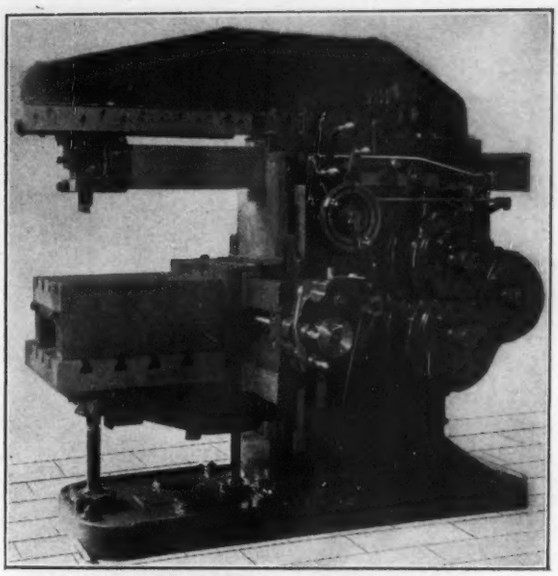
Conveyor Control Insures Safe Operation

No. 186

Kurth & Knapp Mfg. Co., Detroit, has developed a positive conveyor control that automatically stops a conveyor in the event of chain breakage. This safety device prevents accidents to workmen and damage to products. It works under all conditions on up or down grades. The safety stop may be equipped with a limit switch, automatically shutting off power to the conveyor drive, thus

stopping the whole system when the conveyor chain breaks. It has been inspected and approved by the Detroit branch of the National Safety council.

The automatic stop consists of a one-piece forged steel crank composed of a guard arm and a lock arm inserted in a bearing block which is bolted rigidly on top of the monorail conveyor. The guard arm oscillates over trolley wheels as they pass at normal speed. When struck by a runaway trolley wheel this guard arm is thrown violently upward against a stop block forcing down the lock arm which catches and automatically stops the trolley wheel. An oil cup on top of the device provides constant lubrication. When the guard arm is thrown upward by the racing trolley wheels on a broken chain it also engages the limit switch shutting off the conveyor power.



No. 187—Shaper designed for extreme rigidity permits great freedom in setting and removing work. The front of the machine is open on three sides

Shaper Eliminates Spring or Deflection of Ram

No. 187

Morton Mfg. Co., Muskegon Heights, Mich., has announced three new designs in shaper construction to insure extreme rigidity and eliminate all spring or deflection of the ram, regardless of the length of the stroke, also to insure alignment of the table and work at all times. The shaper, one type being shown in the accompanying illustration, can be furnished in sizes with 32 to 60-inch strokes.

The overhead ram cap bearing is of box ribbed construction. With this particular construction, the front or operating side of the machine is open on three sides, and permits greater freedom in setting and removing work and operating the machine. It also simplifies removal of the chips.

A special tool head is used which has an adjustable taper bearing, forming a support to the cutting tool, both top and sidewise. It is fitted to the threaded end of the ram and may be held at any angle when desired by a quick clamping device. The head is provided with a radially adjustable bearing above the cutting tool and with a wedge taper bronze gib for compensating for wear. The bearing against which the head operates is made of special metal and so fitted to the extended ram cap bearing that it may be removed and refitted should the occasion arise. The lathe also is equipped with the new outer-type screw support to the table which assures alignment of the table and the work.

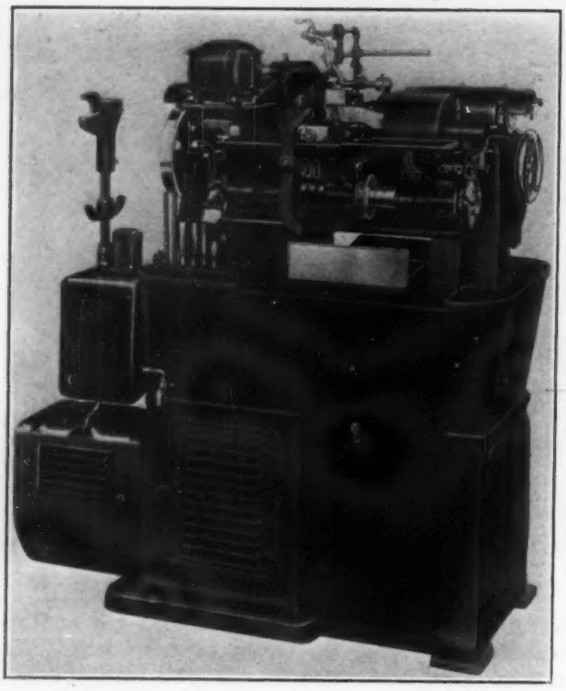
Buffer Design Facilitates Handling of Material

No. 188

Hisey-Wolf Machine Co., Cincinnati, is building a buffing and polishing machine of gooseneck design on which the spindle and buffing wheels extend out from the base of the machine, permitting easy handling of large or odd-shaped pieces. Operators on this machine are permitted by this type of mounting to secure greater

Iron Trade Review's Calendar of New Equipment

Item	Comment	Builder	No.	Date described	Page
Bolt threader	All types of bolts and screws formed and threaded	Landis Machine Co.	161	June 5	83
Snagging machine	Large castings are ground easily; has many adjustments	Ransom Grinding Machine Co.	162	June 5	83
Limit switch	Will control many kinds of equipment; entirely automatic	Cutler-Hammer Inc.	163	June 5	84
Buffing lathe	Base cut down straight in front; has variable control	Bridgeport Safety Emery Wheel Co.	164	June 5	84
Press	Has increased slide adjustments; stresses are reduced	E. W. Bliss Co.	165	June 5	84
Screw machine	Accelerated boring provided; performs reaming operations	National Acme Co.	166	June 5	85
Crosshead planer	Many adjustments available; machines large work	Morton Mfg. Co.	167	June 5	85
Mill cut burrs	Variety of shapes and sizes made of high-carbon steel	Keller Mechanical Engineering Corp.	168	June 5	86
Friction chuck	For tapping and nut and stud setting; 3-inch capacity	Apex Machine Co.	169	June 5	86
Trolley	Built especially for foundry work; resists wear	Louden Machinery Co.	170	June 5	86
Welding rod	Designed for lighter sheets; makes all types of welds	Lincoln Electric Co.	171	June 5	86
Spectroscope	Requires no adjustments; operated by electricity	Adam Hilger Ltd.	172	June 12	71
Rotary machine	Three speeds are provided; has many applications	Peck, Stow & Wilcox Co.	173	June 12	71
Track shoe	Built for heavy-duty work; made of rolled section	Caterpillar Tractor Co.	174	June 12	71
Side head	Shaper attachment will machine locomotive driving boxes	Rockford Machine Tool Co.	175	June 12	72
Electric unit heater	Will heat any type of building; has alloy heating strips	American Foundry Equipment Co.	176	June 12	72
Shaper	Many improvements built into new crank-type machine	American Klopp Shaper Corp.	177	June 12	72
Toggle press	Nonrepeating clutch controls motion; has uniform speed	Zeh & Hahnemann Co.	178	June 12	73
Cutter	Victualic couplings grooved; thread form is omitted	Landis Machine Co.	179	June 12	73
Generator connections	Convenient connections permit changes in voltage	Columbia Electric Mfg. Co.	180	June 12	73
Press brake	Is of unusually large size; distortion eliminated	Cincinnati Shaper Co.	181	June 12	74
Safety switch	Conforms to underwriter's new test procedure	Westinghouse Electric & Mfg. Co.	182	June 12	74
Welding machine	Heavy-duty welder is of light weight; rapid work possible	Micro Products Co.	183	June 19	76
Press brake	Close adjustment is provided; constructed of steel	Long & Allstatter Co.	184	June 19	76
Pillow block	Fits all grades of commercial shafting; is antifriction	Link-Belt Co.	185	June 19	76
Conveyor controller	Automatically stops a conveyor in the event of breakage	Kurth & Knapp Mfg. Co.	186	June 19	76
Shaper	Special tool head is used; is of rigid construction	Morton Mfg. Co.	187	June 19	77
Buffing machine	Gooseneck design facilitates handling; control is simple	Hisey-Wolf Machine Co.	188	June 19	77
Screw threader	Provides wide speed range; machines many metals	Brown & Sharpe Mfg. Co.	189	June 19	78
Nitriding furnace	Is of bell-type construction; has uniform heating	Westinghouse Electric & Mfg. Co.	190	June 19	78
Motor	Special design for runout tables; is completely enclosed	Reliance Electric & Engineering Co.	191	June 19	78



No. 189—Manufacture of parts from steel as well as other metals is possible on redesigned automatic screw threading machine

comfort and ease of operation than was possible in previous designs.

The motor mounting is of the external type with a rigid four-point support which lessens the possibility of inexperienced operators adjusting belts too tightly and so breaking them. The motor is ball-bearing equipped and has dove-tailed sliding base including gib with necessary locking screws. Adjustment is made by means of handwheel and feed screw by which it is comparatively simple to secure proper belt tension and alignment of the motor.

Different spindle speeds can be secured by merely changing the motor pulley, using the same drive. The new design makes it possible to change the belt without pulling the spindle through the bearing housing. By loosening four bolts on each side, the entire spindle assembly may be removed from the machine.

Screw Threader Has Wide Range of Speeds

No. 189

Brown & Sharpe Mfg. Co., Providence, R. I., has redesigned its line of high-speed automatic screw threading machines to provide for a greater range of speeds. The new machines, one of which is shown in the accompanying illustration, are adaptable to the manufacture of parts from steel as well as brass, aluminum and other freely cut metals. Both work spindle and die spindle have a range of 20 speeds each, providing 30 combinations of speeds. The new speed ranges are obtained easily through change gears, belts and pulleys.

In general, all important features of the previous design have been retained. Both work and die spindles run in the same direction but at different speeds, the difference in speeds permitting the die to run on at the required surface speed, after it has been fed to the threading position. The tripping mechanism provides an accurate control for the length of stock threaded by stopping the die spindle when the thread is cut to the required length, leaving the die to run off at the speed of the work spindle.

Nitriding Furnace Has Uniform Heating

No. 190

Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa., has developed production nitriding furnaces of 1000 and 3500-pound capacities, embodying the bell-type construction. The furnace consists of a movable rectangular shaped bell, well insulated and equipped with heating elements around the sidewalls. The bases also are equipped with heating elements to secure even heating of the charge.

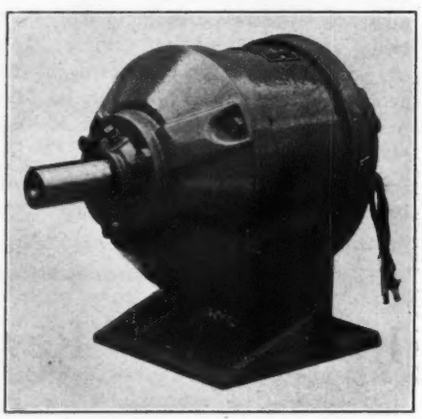
The nitriding boxes are mounted on top of the bases and are connected permanently to the gas supply. The covers of the boxes are built to accommodate a metal seal, and also are equipped with wedges which, by effecting the proper seal, permit passing ammonia gas into the box to exhaust all of the air before the heat is turned on. The ammonia gas is fed into the bottom of the nitriding box through three separate gas distributing pipes which are perforated properly to allow uniform distribution of the gas throughout the box. Two outlet gas pipes are provided near the top of the box and a pressure relief pipe is provided at the bottom. Since the ammonia gas breaks up into nitrogen and hydrogen gases, and as the latter is considerably lighter than the former a greater portion of hydrogen will be liberated through the gas outlet pipes. This gives a high concentration of nitrogen in the system.

Special Motors Are Built for Runout Tables

No. 191

Reliance Electric & Engineering Co., Cleveland, is building special motors for runout tables and steel and tube mills and for other conveyor work. These motors, one of which is shown in the accompanying illustration, are provided with a single heavy-welded steel support so located that a pulley-type roller keyed to the motor shaft can rotate around the body of the motor. Various shaped rollers to suit the material to be conveyed can be used.

The motors with rollers are lined



No. 185—Individual motors facilitate runout table operation

up in tandem, the distance between being governed by the material conveyed. An installation may require any number of units depending on the distance of travel and the roller spacing. The motors are fully enclosed so they are protected from all injurious elements. They are provided with class B installation which is asbestos and mica which will withstand extremely high temperatures.

The advantage of individual motors for the rolls is a gain in flexibility, ease of replacement, and the fact that should a single motor fail, it would not hold up production.

Editorials

Judge Tariff Sanely, Not Politically

WITH the signing this week of the Hawley-Smoot bill President Hoover fulfills his campaign pledged to revise the tariff. Admittedly the measure is not entirely to his liking; originally he intended only to provide greater protection for agriculture and for those industries more harrassed by foreign competition than was visioned in 1922. But considering the contention which tariff legislation always precipitates, the bill probably is the best that could be expected under the circumstances.

Immediately the Democratic party joins the issue and announces its intention of making the tariff the leading issue in this fall's congressional elections. The tariff lends itself easily to the opposition, and from the purely political standpoint the minority cannot be blamed for seeking capital in it. But there is the truth about every situation, and invariably it asserts itself. The minority already has forgotten that its own candidate in 1928 was pledged to protection.

When dispassionately analyzed, the Hawley-Smoot act's increases in duties are mild. They appear chiefly in the foodstuffs sections, and the country seemed unanimous for relief for the farmer. It is difficult to detect a marked rise in the cost of living from an advance of 0.3 cents per pound in sugar and 1 cent per bushel in oats. Not many iron and steel rates were raised.

To the great majority of people and for most industries the costs of their foodstuffs or raw materials will be changed negligibly, if at all. There is much more danger in the political opposition and furor than there is in the tariff itself. There were no breadlines last winter, as there were in 1913 and 1914 when the Underwood free-trade act was effective, and with congress home and busines apparently scraping bottom, it may well be that an upturn will coincide with the disposal of the tariff.

Tungsten Carbide Makes Progress

SINCE cemented tungsten carbide cutting tools were introduced two years ago the metal-working industry has witnessed numerous examples of spectacular achievements in increased productivity and longer tool life. On the other hand, some reports of unsatisfactory performance have been heard. To gain a true picture of the progress of the new material the American Society of Mechanical Engineers, with co-operation from the National Machine Tool Builders' association, recently undertook a fact-revealing survey and although only 50 companies furnished the requested data, sufficient information was received to permit a preliminary report to be made at the spring meeting of the mechanical engineers in Detroit last week. On Page 73 will be found the chief portions of this report.

Experiences of the users of tungsten carbide vary rather widely, depending upon the materials machined and the conditions under which the operations were performed. Applications of the new cutting alloy still are relatively small, but in the majority of cases tests have proved satisfactory. In some instances production per grind has increased as much as 1500 to 2400 per cent compared with high-speed steel.

A significant conclusion to be drawn from the report was the necessity for machine tools constructed to meet the demands imposed by the use of tungsten carbide. Many users encountered difficulties in adapting machines designed for high-speed tools: The high speeds necessary could not be maintained; insufficient rigidity was found in frames, driving shafts and spindles, tailstocks and other members subjected to strain; power was inadequate; bearings were too small; tool holders and feeding mechanisms were too light; and chip handling was unsatisfactory. At the same time, other users found old style machines in good condition satisfactory for certain classes of work. The survey pointed out much of value but indicated that because of the many problems involved unduly rapid adoption of tungsten carbide tools is not to be expected.

Industry Curtails, but Not the Farm

INDUSTRY has heard so much in the past few years concerning the "farm problem" that it cannot help looking a little askance at agriculture, and yet industry has so many advantages over agriculture it can afford to be generous.

For example, industry can control production in a moderate degree—it does not always do it, but it can—while agriculture is largely at the mercy of conditions quite beyond its jurisdiction.

At present, considering all farm products, the crop outlook is fair. Against this are many gloomy

market conditions. It would seem true that people must eat, regardless of employment, but it is a fact that consumption of certain food products, notably cattle, butter, eggs, lambs and many vegetables, has been markedly curtailed.

So, with crop conditions fair to good and the harvest promising to be fairly bounteous, the farmer faces a restricted market. He cannot, however, like the automobile industry, command his fields or livestock to take a two-week vacation. Nature's processes are continuous. So, trying as production problems appear at times, what industrial executive would willingly exchange his worries for those of the farmer?

Freight Rate Pot to Boil

FROM the action of the interstate commerce commission in postponing indefinitely scheduled hearings on fourth-section violations with regard to Docket No. 17,000, under which mileage freight rates effective as of May 20 were prescribed, it may be inferred that the commission will leave the rate pot boiling for the time being.

At the proposed hearings it was expected that many difficulties, relating to short hauls as well as the hauls from Pittsburgh, Youngstown and Buffalo to New York and New England, would be ironed out. The threat of the carriers to put the mills at Buffalo on an American mileage basis to Detroit, rescinding the advantage of shipping via the short route across Canada, also would have come up for airing.

The rate situation continues somewhat confused, and probably will for some months. Apparently many of the alleged injustices and discriminations of the present rate setup will have to continue until, one by one, they are adjusted. Certainly the action of the commission indicates there will be no wholesale opening of the new tariffs. With business slow, it will be difficult to ascertain with certainty the extent to which trade has been dislocated. It may be well, in that light, that rate matters go over for the present.

Higher Capacity Must Be Considered

STEEL production figures for May make less satisfactory reading matter than did those for some of the other months of the year to date, comparing output for the corresponding month of other years as well as in the amount of the decrease from the April rate. The decline in daily production from April was 6.5 per cent, against an average decrease between these two months for the preceding five years of only 3.2 per cent. Daily output in May was 5.8 per cent less than the average May for the preceding five years, compared with an April decrease from the average of 2.5 per cent.

Steelmaking operations have been declining continuously since February, which month, probably because of the sharp contraction in buying late in 1929, was the peak month in 1930 to date. This is the first time on record that February has occupied this position. The decline from March to April and from April to May is a common trend, although there have been a few exceptions. It is equally common for June output to be well under that of May. In the past five years production has declined an average of 6.3 per cent in this period. If the current month does no worse than this it would mean an average rate of about 70 per cent of capacity, but there are indications that operations may dip below this level before the end of the month. The month as a whole should not be far from this figure, however, which would indicate at least a normal trend even if not a satisfactory tonnage.

It is well to point out, moreover, that even if June production should be no better than 65 per cent of capacity it would equal that of June, 1927, and the rate for that month was 82 per cent. The marked increase in steelmaking capacity during the past three years has caused percentage figures to give activity in the industry a more unfavorable picture than the actual tonnage being produced would indicate, although at the same time the constant growth of the country and the steel industry must be considered.

Two Hundred Million for Research

EVEN a casual survey of the increasing efforts and resources being alloted to industrial research in this country indicates something of the dependence of many industrial lines upon the laboratory. Steel companies have been making rapid strides in organized research, while in recent years larger farm equipment makers in the West have turned important sums into the realm of scientific investigation. Records show that thousands of patents go monthly to industrial research organizations.

General trends are in the study of new products, by-products and material, costs and economies of operation, as well as marketing, distribution and trade requirements. Estimates are that close to 55 per cent of the fundamentally producing companies have research laboratories of their own. More than 35,000 are employed and more than $200,000,000 invested in industrial research, exclusive of university, government, control and testing laboratories. The movement is important for what it portends, and illustrates the appreciation on the part of industry with reference to industry's growing responsibilities.

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Simple Technique Developed for Welding 18-8 Steel. Page 59.

Light on the Tariff and Tungsten Carbide

IF THE cost of living is increased 20 per cent as a result of the new tariff law, as opponents of the Hoover administration predict, it will not be because of any favors to iron and steel. The industry asked for little and received less than it wanted. The most important rates are unchanged. A few increases were allowed, and there were no reductions. The new tariff as it pertains to steel, with a self-explanatory index, is summarized on pages 103 and 104.

Experience is the best teacher, in the use of tungsten carbide cutting tools, as in other lines. So all may profit from accumulated experience a committee representing the American Society of Mechanical Engineers addressed a questionnaire to users of tungsten carbide and to machine tool builders. Fifty replies were received and are analyzed in the article on pages 73 to 75. It would take an individual many years to learn what those 50 users have learned in the past year and a half, and available here in 20 minutes of reading.

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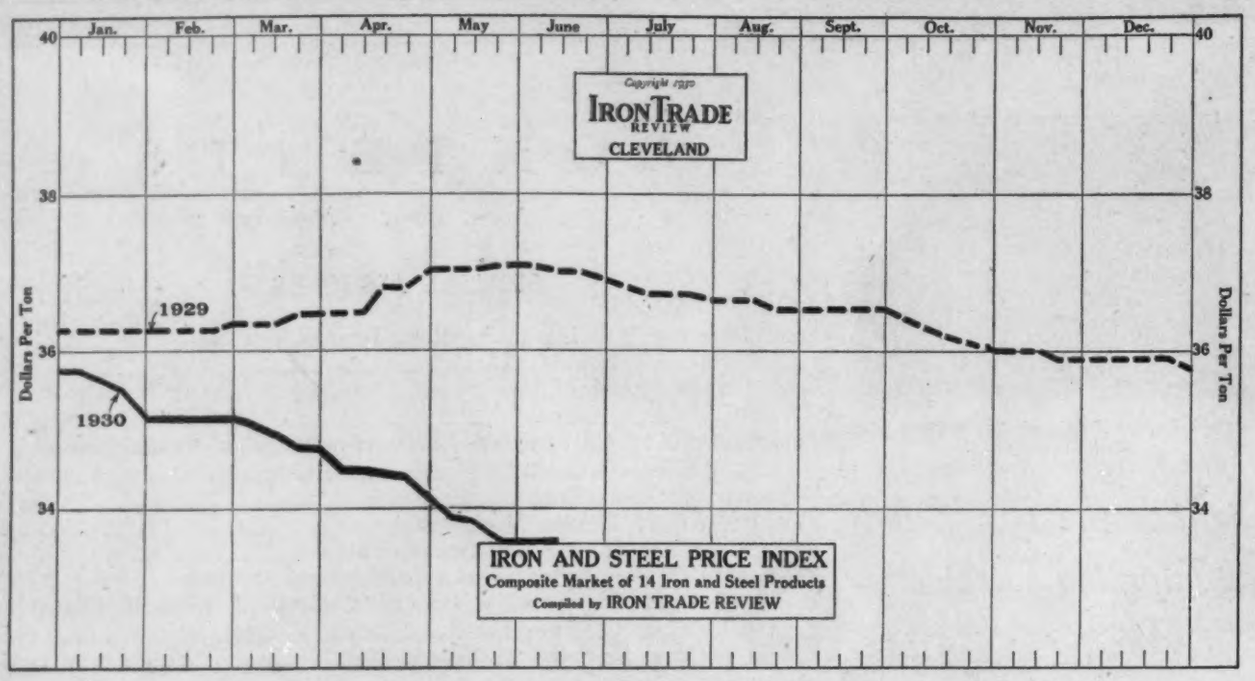
The Business Trend



No Signs of Turning Point Appear

IN BROAD perspective the various factors which make up the fabric of business present meager encouragement to those who have hoped for signs of a turning point during early summer. Even the administration's declaration that signing of the admittedly disappointing tariff bill is justified for the sake of removing the anxiety of tariff uncertainty is not encouraging.

IN THE meantime, many of the indicators of purchasing power continue to show curtailment. Exports in May again dropped, this time to a figure which has not been matched since 1924. Machine tool orders in May dipped rather sharply, again indicating that this is an off year for this branch of industry. Building construction, on which rather impressive hopes for recovery were expressed early this year, has turned the corner and if the May record is representative, we may expect a down swing for some months.

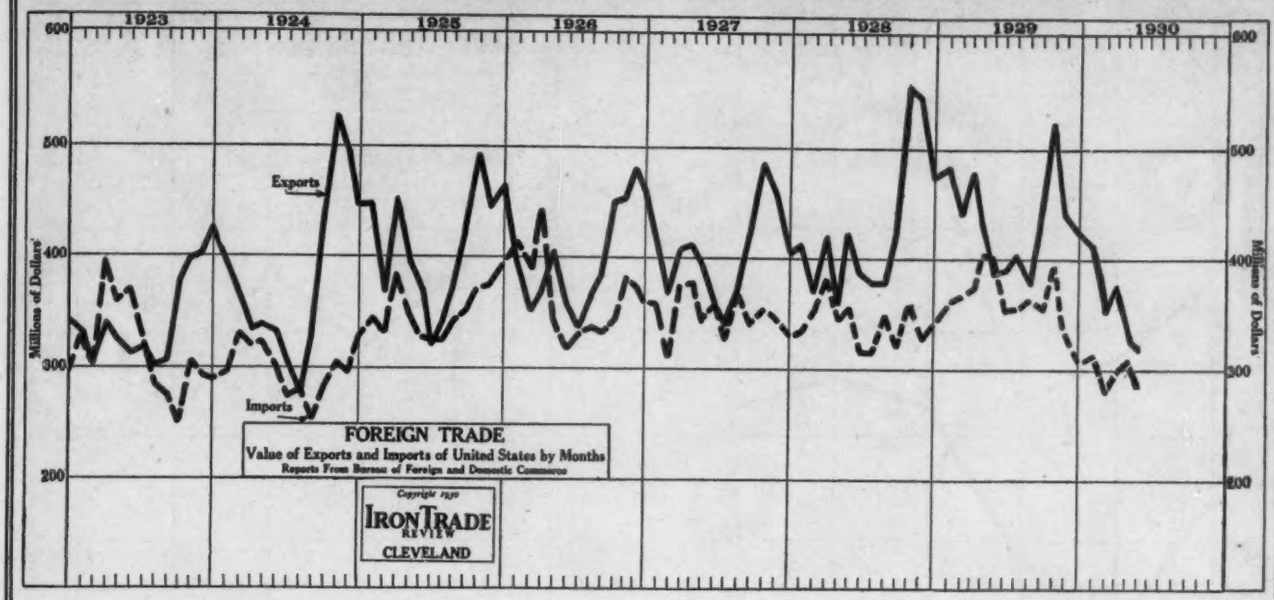
UNFILLED orders of the United States Steel Corp. are lower for the second consecutive month and freight car loadings, last year quite stable at a relatively good level in May, this year were sustained in May at a point well above that established in the previous months of 1930. From these barometers, the only conclusion that can be drawn is that buying is tending slowly downward.

IN COMMON with commodity prices generally, quotations of iron and steel continue their downward trend. IRON TRADE REVIEW'S weekly composite of 14 iron and steel products for June 11 stood at $33.52, the lowest figure yet attained since the decline started last June. The market reports reflect less irregularity in prices, although they have failed thus far to show strength. The decline in six months of 1930 is roughly twice as severe as in the last six months of 1929.

CURTAILED activity coupled with lower commodity prices probably are in the process of playing havoc with second quarter earnings. In the majority of industries, executives are prepared to witness rather disappointing incomes and profits on the reports of business ending June 30. Railroad earnings, as indicated by the net income of Class I roads for April, while slightly higher in April than in March, are lower than in any corresponding month since 1924.

THE depressing tone of the principal business barometers is somewhat discounted by fact that seasonal influences are responsible for a portion of present inactivity. Numerous authorities are pointing to the fact that the prospects look darkest just before the turning point is reached, and are predicting a change in a few months.

The Business Trend

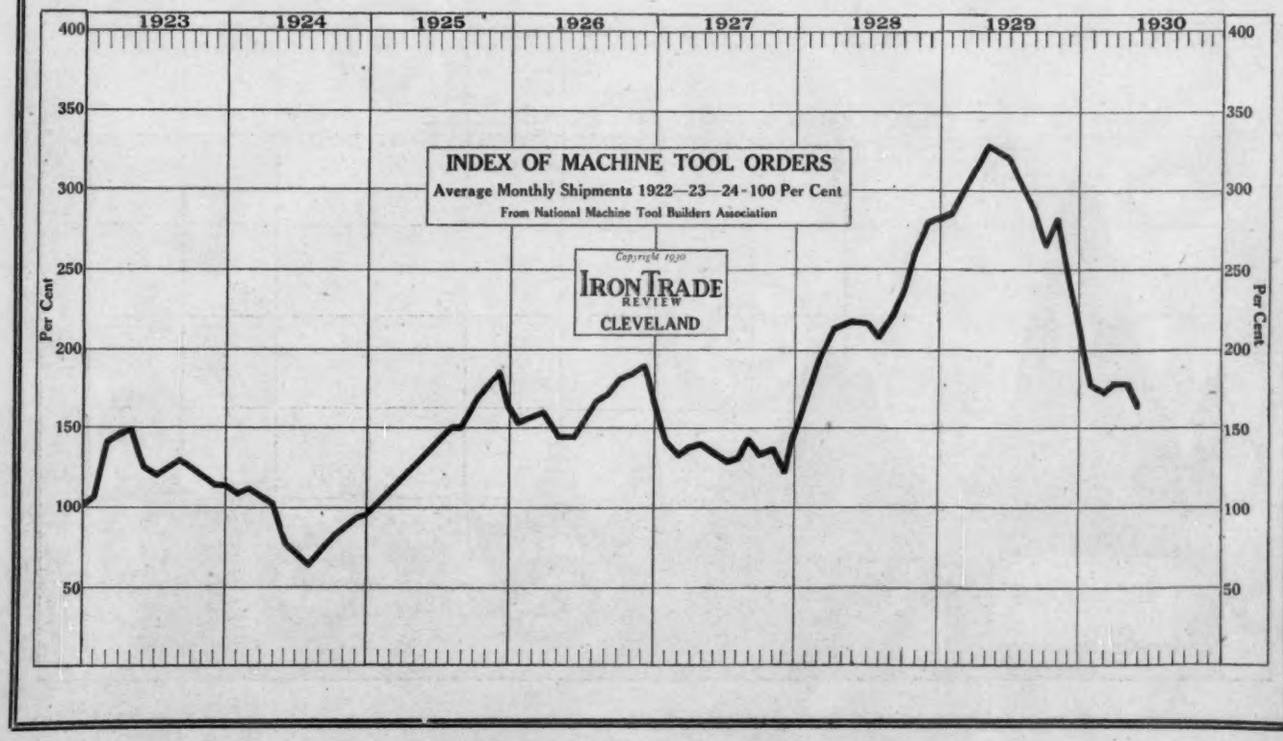


Foreign Trade

WITH exports of only $322,000,000 in May, foreign trade of the United States continued its downward trend. Exports in April were $334,000,000 and in March $369,624,000. It is necessary to go back to 1924 to find a month in which exports were lower than in May, 1930. After staging an increase in April, imports in May dropped back to $285,000,000, a figure approaching the $281,000,000 in February, 1930, the lowest since 1924.

Machine Tool Orders

FOR the second consecutive month, machine tool orders as measured by the three months' moving average index of the National Machine Tool Builders' association registered a decline from the momentary peak in March. The index for May stood at 165.1, compared with 176.8 for April and 177.8 for March. As each month's report is revealed it is more and more apparent that the three-year cycle in the machine tool industry is a fact as well as a theory.



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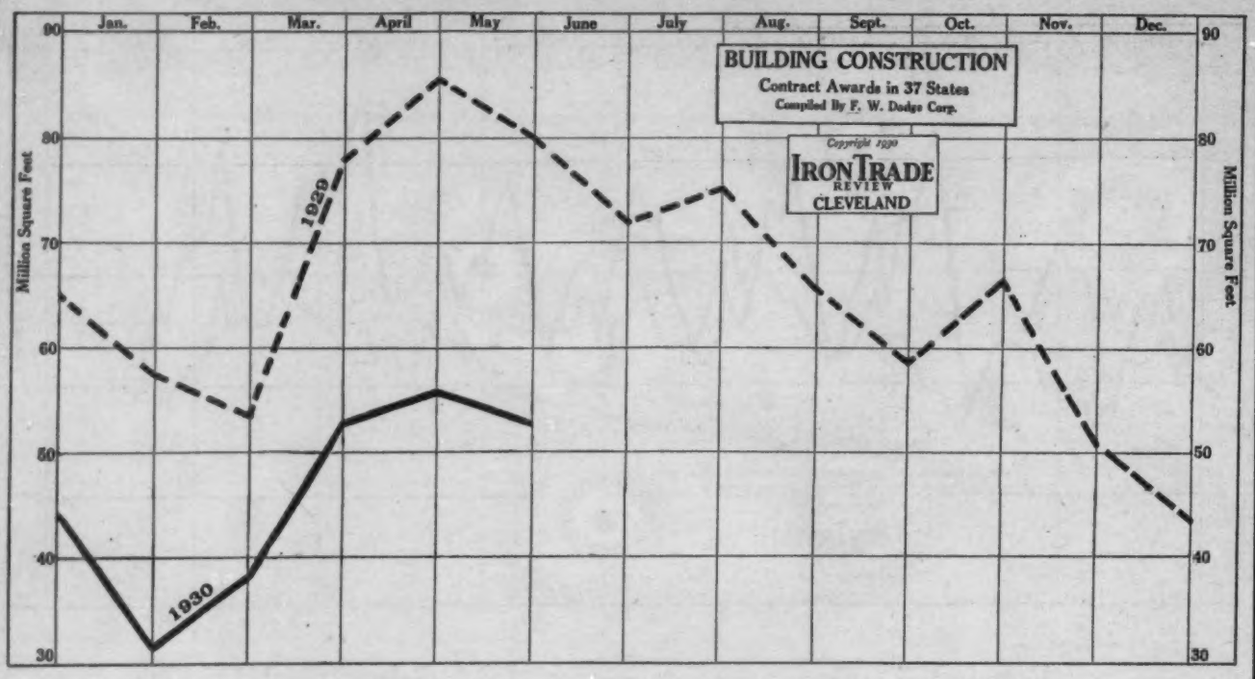
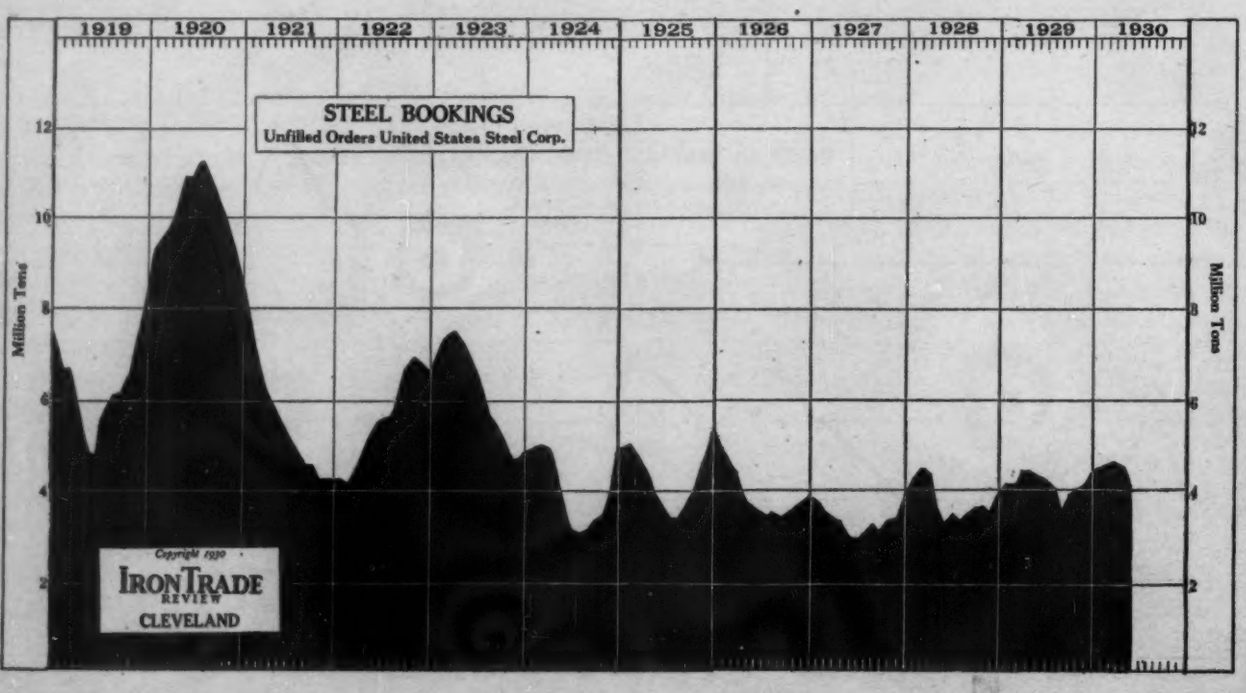


Building Construction

HOPE that building construction might respond to the stimulation of federal and local determination to foster expansion as an aid to employment is dashed by the reports of the F. W. Dodge Corp., which show that for May, awards amounted to 53,732,000 square feet, a decline from 56,600,000 for April. Some slight satisfaction may be obtained from the fact the dip in May was not as sharp as it was at this time last year.

U. S. Steel Bookings

UNFILLED orders of the United States Steel Corp., which thus far in 1930 have totaled more than in the corresponding months of 1929, on May 31 stood at 4,059,227 tons. This is a decline of 294,993 tons from the April 30 figure, which in turn was 216,433 less than the March 31 total. It will be interesting to note whether the recent pipe business will be a factor in halting or retarding the decline. The answer will appear in the totals for June 30.



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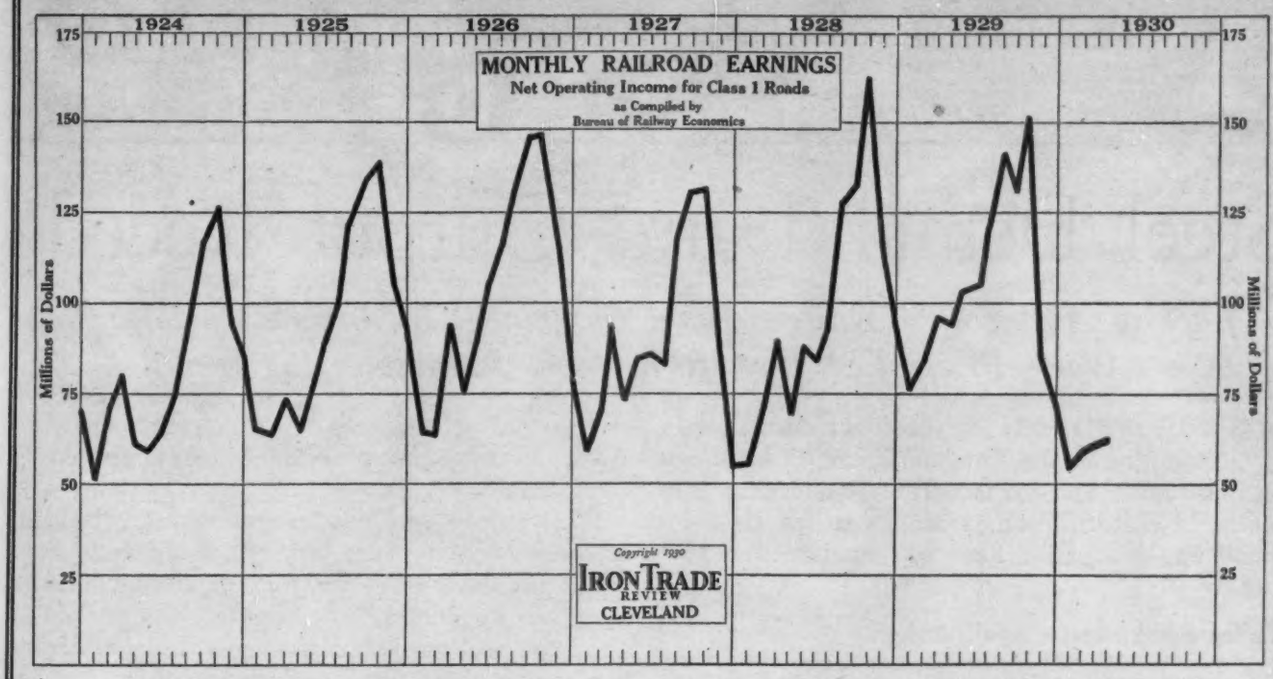
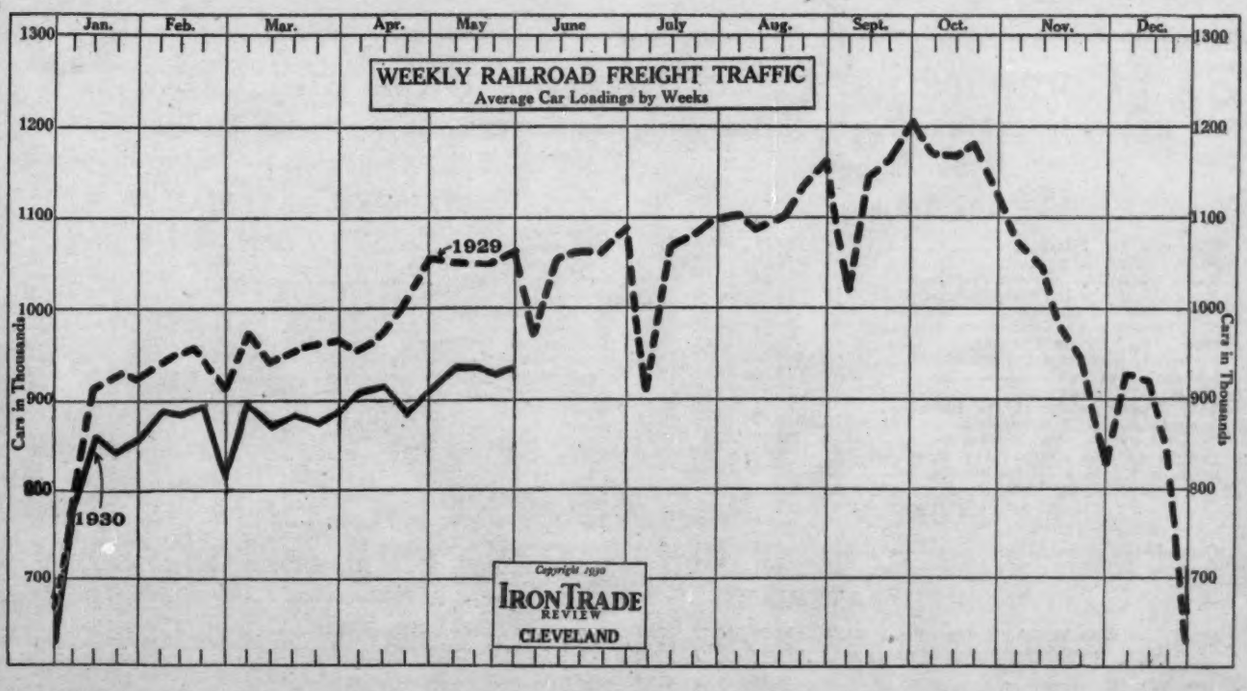


Railroad Earnings

RAILROAD earnings, as indicated by the net operating income of Class I railroads compiled by the Bureau of Railway Economics, in April amounted to $62,271,504. This is a fair gain from the $61,074,229 total for March and is the best record for the year, but is disappointingly low compared with the corresponding earnings in 1929. Unless an unexpected upturn of considerable sharpness is registered in May and June, second quarter earnings will be the lowest since 1922.

Freight Car Loadings

WITH a slight upward swing during the week of May 24, railroad freight traffic for that month is definitely established at a level considerably higher than has prevailed in any month since last November. The average loadings for the week of May 24 were 931,472, a gain of only 1468 from the previous week. Last year freight traffic suffered a sharp decline early in June, and the next reports should show whether this dip will be avoided in 1930.



Steel Demand and Output Recede

Lack of Automotive, Railroad and Implement Buying Felt in Middle West—Prices Less Irregular—More Interest in Pig Iron

CUSHIONED only by excellent backlogs in line pipe in the Pittsburgh and Youngstown districts and by moderate backlogs in ship plates in eastern Pennsylvania, finished steel demand and production have retreated further this week.

Valley Smokestacks Are Rusting

Current requirements of a majority of steel consumers are lighter and interest in the third quarter is negligible, especially in those districts placing major reliance upon automotive, railroad and farm implement business.

Smokestacks of some Mahoning valley sheet mills already are rusty, and July and August promise to be the lowest months of the year in automotive demand, largely because of shutdowns contemplated by Ford and other manufacturers.

Freight car builders at Chicago have practically worked off their orders, and have inquiry for only 3200 cars before them. Implement manufacturers approach inventory time with large stocks. In the past few days there has been a noticeable depression of sentiment in quarters where, a week or two ago, some hopes for improvement were voiced.

Steel prices continue irregular and vulnerable to concessions, but the lack of buying and consequent pressure gives the market a semblance of stability. Producers, however, feel that prices in the main will go little lower, and while willing to contract a short distance into the third quarter are avoiding long-term commitments that would preclude taking advantage of any strength that developed late next quarter. Some quotations are not far above costs.

100,000-Ton Pipe Line Placed

National Tube Co., already practically committed for the remainder of the year, has formally booked 100,000 tons of pipe for a Tulsa-Pittsburgh line for the Gulf Oil Corp. Most active of broad, pending inquiry are lines for the Standard Oil Co. of New Jersey and Columbia Gas & Electric Corp.

The first notable rail order in several months is

Comparative Prices of Iron, Steel and Coke

Representative Market Figures for This Week, Last Month, Three Months and One Year Ago

	June 18, 1930	May 1930	March 1930	June 1929
PIG IRON				
Bessemer, del. Pittsburgh	$20.76	20.76	20.76	20.76
Basic, valley	18.50	18.50	18.50	18.50
Basic, eastern del. eastern Pa.	18.76	18.75	18.80	20.25
No. 2 foundry, del. Pittsburgh	19.76	19.76	19.76	19.76
No. 2 foundry, Chicago	18.50	19.00	19.50	20.00
*Southern No. 2, Birmingham	14.00	14.00	14.00	14.40
**No. 2X, Virginia Furnace	18.25	18.25	18.25	20.00
**No. 2X, Eastern del. Philadelphia	20.26	20.26	20.76	22.76
Malleable, valley	19.00	19.00	19.00	19.00
Malleable, Chicago	18.50	19.00	19.50	20.00
Lake Superior, charcoal, del. Chicago	27.04	27.04	27.04	27.04
Gray forge, del. Pittsburgh	19.13	19.13	19.13	19.13
Ferromanganese, del. Pittsburgh	103.79	103.79	103.79	109.79

*1.75 to 2.25 silicon. For local delivery. Northern shipments based on $12.00 to $13.00, Birmingham. **2.25 to 2.75 silicon.

COKE				
Connellsville furnace, ovens	2.50	2.55	2.60	2.75
Connellsville foundry, ovens	3.50	3.50	3.50	3.75
SEMIFINISHED MATERIAL				
Sheet bars, open-hearth, Youngstown	31.00	32.20	33.00	35.75
Sheet bars, open-hearth, Pittsburgh	31.00	32.20	33.00	35.75
Billets, open-hearth, Pittsburgh	31.00	32.20	33.00	35.75
Wire rods, Pittsburgh	36.00	36.40	38.00	42.00

	June 18, 1930	May 1930	March 1930	June 1929
FINISHED MATERIAL				
Steel bars, Pittsburgh	1.75	1.75	1.85	1.95
Steel bars, Chicago	1.85	1.85	1.90	2.05
Steel bars, Philadelphia	2.04	2.04	2.12	2.27
Iron bars, Chicago	1.90	1.90	1.95	2.05
Shapes, Pittsburgh	1.70	1.75	1.80	1.95
Shapes, Philadelphia	1.76½	1.77	1.81	2.06
Shapes, Chicago	1.80	1.85	1.90	2.05
Tank plates, Pittsburgh	1.70	1.75	1.85	1.95
Tank plates, Philadelphia	1.90½	1.91	2.00	2.15
Tank plates, Chicago	1.80	1.85	1.90	2.05
Sheets, blue anl., No. 13, Pittsburgh	2.05	2.15	2.25	2.35
Sheets, black, No. 24, Pittsburgh	2.55	2.55	2.65	2.95
Sheets, gal., No. 24, Pittsburgh	3.20	3.25	3.30	3.65
Sheets, black, No. 24, Chicago	2.70	2.70	2.80	3.10
Sheets, blue anl., No. 13, Chicago	2.30	2.35	2.50	2.50
Sheets, galvanized, No. 24, Chicago	3.35	3.35	3.45	3.85
Plain wire, Pittsburgh	2.30	2.35	2.40	2.50
Wire nails, Pittsburgh	2.15	2.15	2.30	2.65
Tin plate, per base box, Pittsburgh	5.25	5.25	5.25	5.35
SCRAP				
Heavy melting steel, Pittsburgh	15.00	15.40	16.60	18.30
Heavy melting steel, eastern Pa.	13.25	13.38	14.95	16.25
Heavy melting steel, Chicago	12.00	12.55	13.20	14.95
No. 1 wrought, eastern Pa.	15.25	15.38	15.25	16.25
No. 1 wrought, Chicago	11.25	12.70	13.50	15.40
Rails for rolling, Chicago	14.50	14.90	15.00	17.50

Current Prices for Rolled Steel Products

STEEL PLATES

Pittsburgh, base	1.70c
Philadelphia, del.	1.90½c
New York, del.	1.98c to 2.03c
Boston, del.	2.10c to 2.15c
Chicago, base	1.80c
Cleveland, delivered	1.89c
Lackawanna, N. Y., base	1.80c
Birmingham, base	1.85c to 1.90c
Contesville, Pa., base	1.80c
Pacific Coast, c.i.f.	2.25c
St. Louis, del.	2.12c
Detroit, del.	1.96½c

STRUCTURAL SHAPES

Pittsburgh, base	1.70c
Philadelphia, del.	1.76½c to 1.86½c
New York, del.	1.90½c to 2.10½c
Boston, del.	2.03½c to 2.13½c
Chicago, base	1.80c
Cleveland, delivered	1.89c
Lackawanna, N. Y.	1.80c
Birmingham, base	1.85c to 1.90c
Pacific Coast, c.i.f.	2.35c
Detroit, del.	1.96½c

BARS

SOFT STEEL

Pittsburgh, base	1.75c
Chicago, base	1.85c
Birmingham, base	1.90c to 1.95c
Lackawanna, N. Y., base	1.85c
Pacific Coast, c.i.f.	2.35c
Cleveland, base, local mills	1.75c to 1.80c
Cleveland, del., outside mills	1.82½c
Philadelphia, del.	2.04c to 2.09c
New York, delivered	2.08c
Boston, delivered	2.15c
Detroit, del.	2.00c
Pittsburgh, cold finishing	1.90c
Pittsburgh, forging quality	2.00c

RAIL STEEL

Chicago Heights	1.75c
Eastern mills	1.85c to 1.95c

IRON

Chicago, base	1.90c
New York, delivered	2.03c
Philadelphia, delivered	1.99c to 2.04c
Pittsburgh, refined	2.75c to 4.25c

REINFORCING

Pittsburgh, billet cut lengths	2.00c to 2.05c
Stock lengths from mill	1.75c to 1.80c
Chicago billet, over 500 tons	1.85c
30 to 500 tons	2.00c
Under 30 tons	2.45c
Chicago, rail steel	1.65c to 1.70c
Road and bridge work	1.80c
Philadelphia, cut lengths	2.14c

CORROSION, HEAT RESISTANT ALLOYS

Base, Pittsburgh

18 per cent chrome, 8 per cent nickel

Sheets....35.00c; plates....31.00c; bars....28.00c

	A	B	C	D
Bars	19c	20.5c	23c	28c
Plates	22c	23.5c	26c	31c
Sheets	26c	27.5c	30c	35c
Hot strip	19c	20.5c	23c	28c
Cold strip	28c	29.5c	32c	37c

Carbon 0.12 and under; no nickel. A has chrome 15% and under, B over 15/18% inc., C over 18/23% inc., D over 23/30%.

SHEETS

SHEET MILL BLACK, No. 24

Pittsburgh, base	2.50c to 2.55c
Detroit, delivered	2.76½c to 2.81½c
Philadelphia, delivered	2.84c
Gary, Indiana Harbor	2.65c
Chicago, delivered	2.70c
Birmingham, base	2.75c
St. Louis, del.	2.97c

TIN MILL BLACK NO. 28

Pittsburgh, base	2.80c to 2.90c
Gary, base	2.90c to 3.00c

GALVANIZED NO. 24

Pittsburgh, base	3.20c
Philadelphia, delivered	3.44c
Gary, Indiana Harbor	3.30c
Chicago, delivered	3.35c
Birmingham, base	3.40c
St. Louis, del.	3.62c

BLUE ANNEALED SHEETS NO. 13

Pittsburgh, base*	1.95c to 2.15c
Chicago, district mills	2.25c to 2.35c
Chicago, delivered	2.30c to 2.40c
St. Louis, delivered	2.57c
Philadelphia, delivered	2.44c
Birmingham	2.35c

*Minimum price is on continuous mill product.

BLUE ANNEALED PLATES, NO. 9-10

Pittsburgh, base*	1.80c to 2.00c
Chicago, district mills	2.10c to 2.20c
Chicago, delivered	2.15c to 2.25c
Philadelphia, delivered	2.29c
St. Louis, delivered	2.42c
Birmingham	2.20c

*Minimum price is on continuous mill product.

AUTOMOBILE NO. 20

Pittsburgh, base	3.60c to 3.70c
Detroit, delivered	3.86½c to 3.96½c

FURNITURE NO. 24

Pittsburgh	3.80c

(Turn to the following page)

the 50,000 tons reported placed by the Santa Fe railroad with the Colorado Fuel & Iron Co. Still pending are the inquiries of the Norfolk & Western for 40,000 tons and the Pittsburgh & West Virginia for 5000 tons. A good many railroads will specify only a small percentage of the rails optioned at the time of their 1930 purchases.

Plates continue the most active finished product, reflecting pipe and shipbuilding demand. Bars, sheets and strip in particular are depressed by declining automotive buying. Tin plate shipments continue moderately heavy, with the price for last half not finally determined.

New York subways, requiring 20,000 tons, and a school at Brooklyn, N. Y., 10,000 tons, lead moderate structural inquiry. Awards this week, at 34,413 tons, compare with 30,992 tons last week and 21,285 tons a year ago. Thus far in 1930 structural awards have aggregated 859,794 tons; a year ago 1,086,125 tons. Concrete reinforcing business is up to the high level of May.

Use More Pig, Less Scrap

In pig iron a slight quickening in interest in the third quarter is evident at Cleveland, and New York. Shipments, however, show no acceleration. Beehive coke production is at 30 per cent of last year's rate. Scrap continues weak, and a number of steelmakers are using a heavier percentage of hot metal, precluding dropping some blast furnace capacity. Steelmaking operations have declined sharpest in the districts most dependent upon automotive and railroad buying. Compared with a month ago, steel rates at Cleveland have sunk from 76 per cent to 50 per cent today, at Chicago from 90 per cent to 70, and at Youngstown from 70 per cent to about 60. Pittsburgh, at 70 per cent, is off only 5 points in the past month.

Steel Rates Fall 3 Points

Steel corporation subsidiaries are operating this week at 72 per cent and independents at 64, both down 3 points. For the entire industry the average this week is 68 per cent, against 71 last week. A year ago the industry averaged 96 per cent and two years ago 73.

Threats of reprisals abroad are disturbing to iron and steel interests along the seaboards who are more interested in exports than imports. On the other hand, the tariff wall against iron and steel is, on the whole, only slightly higher, much less so than the industry requested. Pig iron and manganese ore, on which sharp advances were asked, remain substantially unchanged. Cast iron pipe is dutiable at 25 per cent instead of 20, while on a few finished steel products the imposts are somewhat advanced. The new rates became effective at midnight, June 17. Although the price situation still contains soft spots, the lack of buying cloaks them. As a result the IRON TRADE REVIEW composite is unchanged this week at $33.52. Its average for May was $33.73 and for last June $36.96.

Composite Market Averages

Based on Pig Iron, Billets, Slabs, Sheet Bars, Wire Rods, Steel Bars, Plates, Structural Shapes, Black, Galvanized and Blue Annealed Sheets, Tin Plate, Wire Nails and Black Pipe

This week (June 18, 1930)	$33.52
Last week (June 11, 1930)	33.52
One month ago (May, 1930)	33.73
Three months ago (March, 1930)	34.95
One year ago (June, 1929)	36.96
Ten years ago (June, 1920)	67.89
Fifteen years ago (June, 1915)	23.74

Current Rolled Steel Prices

PRICES IN CENTS PER POUND UNLESS OTHERWISE INDICATED

Tubular Products Quoted on Last Editorial Page—See Preceding Page for Other Products

HOOPS, BANDS, STRIPS

Hot strip, to 6-in., Pitts.	1.80c
Delivered, Detroit	2.01½c
Hot strip 6-¼ to 24-in., Pitts.	1.70c
Delivered Detroit	1.91½c
Hot strip, bands 6 in. and under, Chicago	1.90c
Do. 6-¼ to 24	1.80c
Cooperage stocks, Pittsburgh	2.00c to 2.10c
Do. Chicago	2.10c to 2.20c
Cold rolled strip, hard coils, 16 inches and under by 0.100-inch and heavier, base Pitts., Cleve. (3 tons and over)	2.45c to 2.55c
Delivered, Detroit	2.65c to 2.75c
Worcester, Mass., (3 tons and over)	2.60c to 2.70c

ALLOY STEEL

Hot Rolled—F.o.b. Mills
Alloy Quality Bar Base is 2.65c

S.A.E. Series Number	Alloy differentials	Net 100 lb. bars
2000	0.25	$2.90
2100	0.55	3.20
2300	1.50	4.15
2500	2.25	4.90
3100	0.55	3.20
3200	1.35	4.00
3300	3.80	6.45
3400	3.20	5.85
4100 0.15-0.25 Mo.	0.50	3.15
4100 0.25-0.40 Mo.	0.70	3.35
4600 0.20-0.30 Mo. 125-1.75 Ni.	1.05	3.70
5100 0.60-0.90 Cr.	0.35	3.00
5100 0.80-1.10 Cr.	0.45	3.10
5100 Chrome Spring	0.20	2.85
6100 Bars	1.20	3.85
6100 Spring Steel	0.95	3.60
Chrome Nickel Vanad'm	1.50	4.15
Carbon Vanadium	0.95	3.60
9250 (flats)	0.25	2.90
9250 (rounds, squares)	0.50	3.15

Hot rolled alloy billets 4 x 4-inch and over take same prices per gross ton as same specification alloys bars per net ton. Sizes under 4 x 4 to 2½ in. x 2½ in. inclusive sold on bar basis plus steel bar card extras for size. Sizes under 2½ in. x 2½ in. take bar price on net ton basis.

COLD FINISHED STEEL

Bars, drawn or rolled, Pitts., Chicago and Buffalo	2.10c
Do, Cleveland	2.00c to 2.10c
Do, delivered, Detroit	2.20c
Shafting (turned, polished) Pittsburgh, Buffalo	2.10c
Shafting (turned, ground) mill (Depending on size, 1 3/16 to 7-inch)	2.45c to 2.90c

WIRE PRODUCTS

F.o.b. Pittsburgh, Cleveland base
(Per 100 pound keg)
(To Jobbers—Merchant Trade)

Standard wire nails	$2.15 and 2.25
Cement coated nails	2.15 and 2.25
Galvanized nails	4.15 and 4.25

(Per pound)

Polished staples	2.60c and 2.70c
Galvanized staples	2.85c and 2.95c
Barbed wire, galvanized	2.80c and 2.90c
Annealed fence wire	2.30c and 2.40c
Galvanized wire	2.75c and 2.85c

Woven wire fencing, retailers, Pittsburgh-Cleveland, net ton $65.

(To Manufacturing Trade)

Bright plain wire, 6 to 9 gage	2.30c
Spring wire	3.30c
Wire, delivered Detroit	2.53½c
Nails, delivered Detroit	$2.38½

Joliet, DeKalb and Waukegan, Ill., Anderson, Ind., and Chicago prices $1 per ton over Pittsburgh-Cleveland base on products made there. Duluth and Worcester, Mass., $2 higher; Fairfield, Ala., $3 higher.

CUT NAILS, CHAIN, PILING

Cut nails, c.l., f.o.b. mills	2.45c to 2.55c
Cut nails, l.c.l., f.o.b. mills	2.55c to 2.65c
Sheet piling, base, Pittsburgh	2.00c to 2.10c

Chain proof BB and BBB, Pitts.

3/16-in. to ½-in.	33 1/3 and 5 off
9/16-in. to 1½-in.	33 1/3 off

CAST IRON WATER PIPE

Class B Pipe—Per Net Ton

Six-inch and over, Birmingh'm	$37.00 to 38.00
Four-inch, Birmingham	41.00 to 42.00
Four-inch, Chicago	47.20 to 49.20
Six-inch to 24-inch, Chicago	43.20 to 45.20
Six-inch and over, New York	38.50 to 40.50
Four-inch, New York	41.50 to 42.50
Standard fittings, Bir. base	$100.00

Six to 24-inch, base; over 24-inch plus $20; 4-inch, plus $10; 3-inch, plus $20; gas pipe fittings, $5 higher.

Class A pipe is $4 higher than Class B.

TIN PLATE; TERNE PLATE

Prices per 100-pound box Pittsburgh

*Tin plate, coke base	$5.25

Gary, Ind., base 10 cents higher.

Long ternes, primes, No. 24 .... 3.65c to 3.75c

*Price subject to quantity differentials.

WASHERS

Wrought, c.l., Pitts., dist.	$6.50 to 6.75 off
Wrought, l.c.l., Chicago dist.	$6.50 to 6.75 off
Wrought, c.l., Chicago	$6.70 to 6.80 off

RAILS, TRACK MATERIAL

Standard bessemer rails, mill	$43.00
Standard open-h'th rails, mill	$43.00
Relay rails, Pitts., 60 to 90 lb.	$25.00 to 29.00
Light rails, 25 to 45, mills	$36.00
Angle bars, Chicago base	2.75c
Spikes, railroad, mills	2.80c
Spikes, small railroad, 7/16-inch and smaller, Pitts.	2.80c
Spikes, boat and barge, Pitts.	3.00c
Spikes, railroad, Chicago	2.80c
Track bolts, Pitts., steam roads	3.80c
Track bolts, Pitts., stand. jobbers	73 off list
Track bolts, Chicago	3.80c
Tie plates, mills	$41.50

BOLTS AND NUTS

Pittsburgh, Cleveland, Birmingham and Chicago

Discounts are for legitimate jobbing or large consuming trade purchasing in full-case lists, apply to lists of May 10, 1930.

CARRIAGE BOLTS

All sizes, cut thread	73 off
Rolled thread ⅝ x 6 and smaller take 10 per cent lower list.	
Eagle list	73 off

MACHINE BOLTS

All sizes, cut thread	73 off
Rolled thread ⅝ x 6 and smaller take 10 per cent lower list.	
Lag screws	73 off
Plow bolts, Nos. 1-2-3-7 heads	73 off
Tap bolts	73 off
Blank bolts	73 off
Stud bolts without nuts	73 off
Stove bolts, 80, 10, 10 and 5 off in pkgs.; 80, 10, 10, 5 and 2½ off in bulk.	
Tire bolts	60, 10 and 10 off

NUTS

Semifinished	73 off

*HEXAGON CAP SCREWS

Milled	80-10-5 off
Upset 1 in. diam. and smaller	85-10 off

*SQUARE HEAD SET SCREWS

Milled	80-5 off
Upset 1 in. diam. and smaller	80-10-5 off

*Discounts dated Jan. 23, 1930.

RIVETS

Struc. c.l., Pitts.-Cleve.	2.90c
Structural, c.l., Chicago	3.00c
**7/16-inch and smaller, Pitts.	70, 10 and 5 off
Chi., Cleve.	70 to 70, 10 and 5 off

**Some makers quoting 70 off with freight allowed on 300 pounds or more.

Raw Materials and Semifinished Products

SEMIFINISHED STEEL

Prices Per Gross Ton

BILLETS AND BLOOMS
4 x 4-inch base

Pittsburgh, open-hearth	$31.00
Pittsburgh, bessemer	31.00
Youngstown	31.00
Cleveland	31.00
Philadelphia	37.30
Chicago	32.00 to 33.00
Forging, Chicago	37.00
Forging, Pittsburgh	36.00 to 37.00
Forging, Philadelphia	42.30

SHEET BARS

Pittsburgh	$31.00
Youngstown	31.00
Cleveland	31.00
Chicago	32.00

SLABS

Pittsburgh	$31.00
Youngstown	31.00
Cleveland	31.00

WIRE RODS

Pittsburgh, Cleveland	$36.00
Chicago	37.00

SKELP

All grades, Pittsburgh	1.70c to 1.75c

IRON ORE

LAKE SUPERIOR ORE
Per Gross Ton, Lower Lake Ports

Old range bessemer, 51½%	$4.80
Mesabi bessemer, 51½%	4.65
Old range nonbessemer, 51½%	4.65
Mesabi nonbessemer, 51½%	4.50
High phosphorus, 51½%	4.40

EASTERN LOCAL ORES
Cents per unit delivered at Eastern Pennsylvania and New Jersey furnaces

Foundry and basic, 56-63% (contract)	10.00
Copper-free low phos. 58-65%	nominal

FOREIGN ORE
Cents per units, alongside docks Atlantic ports

Foreign manganiferous ore, 45-55%, iron, 6-10% manganese	10.50 to 11.00
North African low phosphorus	10.50
Swedish basic, 65%	9.50 to 10.50
Swedish low phosphorus	11.00
Spanish and North African basic, 50 to 60%	9.50 to 10.00
Newfoundland foundry, 55%	9.00
Tungsten, spot and future, short ton unit, duty paid	13.50 to 14.00
Chrome ore, 48%, net ton c.i.f.	$21.50 to 22.50

MANGANESE ORE

Prices, not including duty, are cents per unit; cargo lots.

Caucasian (52-55 per cent)	30 cents
Indian (48-50 per cent)	30 cents
Brazilian (46-48 per cent)	28 cents

FLUORSPAR

85 and 5 per cent grade

Washed gravel, Kentucky and Illinois mines, per net ton	$18.00
Washed gravel, import duty paid east, tide., gross ton	$19.50 to 20.50

REFRACTORIES

FIRE CLAY BRICK
Per 1000 f.o.b. Works
First Quality

Pennsylvania, Ohio, Illinois, Kentucky, Missouri, Maryland	$43.00
Georgia, Alabama	40.00 to 47.00

Second Quality

Pennsylvania, Ohio, Illinois Kentucky, Missouri, Maryland	35.00 to 38.00
Georgia, Alabama	30.00 to 35.00

SILICA BRICK

Pennsylvania	43.00
Joliet, Ill., East Chicago, Ind.	52.00
Birmingham, Ala.	50.00 to 51.00

MAGNESITE BRICK
Per net ton.

9 x 4½ x 2½	65.00

MAGNESITE

Dead burned grain, net ton, Chester, Pa., or Baltimore base	40.00
Domes, Chewelah, Wash., base	22.00

CHROME BRICK

Net ton, Chester, Pa., and Baltimore base	
9 x 4½ x 2½	45.00

Pig Iron

Market Is More Active in Inquiries and Sales —Shipments Steady at May Rate—Large Users Covering for Third Quarter

SALES of pig iron and inquiries for third quarter are more active. Cleveland interests booked 14,500 tons in the week. New York reports 7000 to 8000 tons; Buffalo 5000 tons and Cincinnati 4500 tons. More action also is noted in the Chicago district. Westinghouse Electric & Mfg. Co. is in the market for substantial tonnages at Cleveland and Trafford City, Pa. Worthington Pump & Machinery Corp. is inquiring for around 3000 tons for several plants, and General Electric Co. is expected to close soon on 1350 tons for eastern works. An eastern Ohio melter wants 2500 tons, and a central Illinois implement maker is inquiring for around 2000 tons of malleable. From 10,000 to 15,000 tons is on inquiry at Cleveland. Shipments show little change.

PITTSBURGH, June 17.—Demand for pig iron continues at low ebb. Both shipments and new buying are at slow rate, shipments failing to make inroads on output although four of seven merchant stacks in the Pittsburgh and valley districts are idle. Small orders are booked regularly but the aggregate is light. The Westinghouse Electric & Mfg. Co. is inquiring for requirements at Trafford City, Pa., and Cleveland. No specific tonnage is mentioned. Other inquiry is dull. Valley prices are unchanged, with Pittsburgh furnace quotations 50 cents above the valley levels.

Boston, June 17.—Pig iron sales here in the past week dropped to 1000 tons. The General Electric Co. has not yet closed on its inquiry for requirements at Pittsfield and Lynn, Mass. A Connecticut melter is in the market for 1250 tons of malleable. Prices are unchanged.

New York, June 17.—While large orders are lacking pig iron buying is slightly better, sales in the past week aggregating 7000 to 8000 tons. Inquiry totals at least 5000 tons, notwithstanding the withdrawal of two lots amounting to approximately 3500 tons. Prices of Buffalo iron are unchanged at $16 to $16.50, base, furnace, and southern iron is $18 to $18.50, delivered, New York docks. Leading inquiries include 1500 tons for the Worthington Pump & Machinery Corp., Harrison, N. J. Action on 1350 tons for the General Electric Co.'s various eastern plants is expected shortly. An importer has brought 1000 tons of Swedish charcoal iron into Baltimore to apply against a single order for 1500 tons. The remaining 500 tons will arrive later. Swedish charcoal iron has been holding at around $36 a ton, f.o.b., Atlantic ports.

Buffalo, June 17.—Producers here report 4000 to 5000 tons of new inquiry for pig iron. One lot of 1000 tons of foundry and malleable is wanted for eastern delivery. This inquiry probably will establish current prices for third quarter. Producers say they will not shade $16, base, furnace, on eastern inquiry, and that the district base of $18.50 also will be maintained.

Youngstown, O., June 17.—Buying of various grades of pig iron has been reduced to a minimum, while shipments from furnaces continue fairly steady on contracts. Blast furnace operations have not changed in the past week. No. 2 foundry and basic continue $18.50, furnace, and malleable and bessemer $19.

Pig Iron Prices

Per Gross Ton

FOUNDRY NO. 2	
Chicago, furnace	$18.50
Chicago, lake dock	17.50 to 18.00
Pittsburgh, district furnace	19.00
Pittsburgh, delivered	19.63 to 20.13
Valley, furnace	18.50
Cleveland furnace, local delivery	18.50
Philadelphia, delivered	19.76 to 20.26
Virginia, furnace	17.75
Granite City, Ill., furnace	19.00
Buffalo, furnace, local delivered	18.50
Buffalo, delivered Boston	21.41 to 21.91
Buffalo, del. all-rail, Brooklyn	20.91 to 21.41
Buffalo, delivered, all-rail, Newark	19.28 to 19.78
Ala., Birmingham fur., local del.	14.00
Alabama, delivered Chicago	18.01
Alabama, delivered St. Louis	17.42
Alabama, delivered Cincinnati	16.69 to 18.19
Alabama, delivered Cleveland	18.51 to 19.01
Alabama, Philadelphia dock del.	17.25 to 18.25
Alabama, Baltimore dock delivery	17.00 to 18.00
Alabama, New York dock delivery	18.00 to 18.50
Alabama, Boston dock delivery	20.21
Tenn., Birmingham base, local del.	14.00
Tennessee, delivered Cincinnati	16.69 to 18.19
Montreal, delivered	23.50
Toronto, delivered	22.10
FOUNDRY, NO. 2X	
Buffalo, furnace, local delivery	19.00
Buffalo, all-rail, Brooklyn	21.41 to 21.91
Buffalo, all-rail, Newark	19.78 to 20.28
Buffalo, delivered Boston	21.91 to 22.41
Virginia furnace	18.25
Eastern, delivered Philadelphia	20.26 to 20.76
FOUNDRY, NO. 1X	
Buffalo furnace, local delivery	20.00
Eastern, delivered Philadelphia	20.76 to 21.26
MALLEABLE	
Chicago, furnace	18.50
Chicago, lake dock	17.50 to 18.00
Cleveland furnace, local delivery	18.50
Pittsburgh district furnace	19.50
Pittsburgh, delivered	20.13 to 20.63
Valley furnace	19.00
Buffalo furnace, local delivery	19.00
Eastern Penn., delivered	19.76 to 21.41
Granite City, Ill., furnace	19.00
Montreal, delivered	24.00
Toronto, delivered	22.60
BASIC	
Pittsburgh district furnace	19.00
Pittsburgh, delivered	19.63 to 20.13
Eastern Penn., delivered	18.50 to 19.00
Buffalo furnace, local delivery	18.00
Montreal, delivered	22.50
Valley, furnace	18.50
BESSEMER	
Valley, furnace	19.00
Pittsburgh, delivered	20.76
LOW PHOS	
Valley furnace, standard	27.00
Philadelphia, standard	24.76
Furnace, copper-bearing	23.00 to 23.50
GRAY FORGE	
Pittsburgh district furnace	18.50
Pittsburgh, delivered	19.13 to 19.63
CHARCOAL	
Lake Superior, delivered Chicago	23.04 to 27.04

SILVERY

Jackson County, O., furnace, in per cents.

5—$21.50; 6—$21.50; 7—$22.00; 8—22.50; 9—$23; 10—$23.50; 11—$24.50; 12—$25.50; 13—$26.50.

BESSEMER FERROSILICON

Jackson County, O., furnace, in per cents.

10—$29; 11—$31; 12—$33; 13—$35; 14—$37; 15—$39; 16—$42; 17—$45.

Cleveland, June 17.—More and larger inquiries for pig iron for third quarter feature the market. Sales also increased the past week, furnace interests with headquarters here and in Detroit booking 14,500 tons, compared with 8300 tons the week preceding. About 20 melters are asking for third quarter prices and sellers here estimate the total pending at 10,000 to 15,000 tons. Westinghouse Electric & Mfg. Co. is inquiring for a portion of its requirements at Cleveland and Trafford City, Pa. The tonnage is not specified, but normally the two plants consume more than 5000 tons in a quarter. Worthington Pump & Machinery Corp. wants 1500 tons for Buffalo, and a few carloads for Cincinnati. An unidentified Ohio melter is inquiring for 2500 tons. Several Cleveland melters are expected in the market soon. Shipments are little changed from the May rate. Cleveland furnaces book orders for local shipment at $18.50, base, furnace, while $18 is the usual price for outside competitive points. The lake furnace price in western Ohio and Indiana is $18, and in Michigan $18.50 to $19. Sales of silvery iron are lacking and furnace representatives here say they have no fixed schedule. Competition between Buffalo and southern Ohio makers in the Chicago district resulted in lower prices there. In Ohio prices are nominal and vary with destination.

Cincinnati, June 17.—Sales of pig iron in this district the past week totaled 4500 tons. Reports indicate little if any shading on southern iron from the quotation of $13, base, Birmingham. An eastern Ohio melter is inquiring for 2000 to 2500 tons of northern iron for third quarter. Louisville & Nashville railroad's current requirements are 200 tons of southern iron, 175 tons of high manganese, 60 tons of charcoal and 60 tons of low silicon.

Chicago, June 17.—This district continues a battleground of pig iron prices. Quotations of $12, base, for southern iron permit all-rail deliveries from Alabama furnaces at slightly over $18. Prices of Chicago furnace

(*Concluded on Page* 98)

Coke

New Business Quiet—Shipments on Contracts Steady—Users Slow to Cover Requirements

COKE production in the Connellsville district is at a rate approximately 30 per cent of that a year ago. A slight improvement is noted in recent operations, as contract shipments of furnace and foundry grades are fairly steady. Some consumers of by-product foundry coke are deferring deliveries, with a considerable carry-over on first half contracts. Prices are steady.

Pittsburgh, June 17.—The market for beehive coke is quiet while continued restriction in output maintains a fairly steady tone. Furnace coke shipments are holding well but spot buying is dull. Standard beehive furnace fuel continues $2.50 on the majority of spot tonnages. Activity in foundry coke is tending downward but prices are steady at $3.50 to $4.85. Production has increased moderately as a result of the absorption of surplus fuel accumulated recently.

Production of coke in the Connellsville region for the week ended June 7 was 32,200 tons compared with 29,960 tons the preceding week, and 108,190 tons in the same period a year ago, according to the *Connellsville Courier*.

Boston, June 17.—Consumption of foundry coke is lower, with melters seeking to defer shipments. Business is quiet and prices unchanged.

New York, June 17.—Dullness prevails in coke with the beehive furnace grade soft at $2.50 to $2.60, Connellsville, and standard grades of beehive foundry coke, $3.50 to $3.75, Connellsville. Premium brands are $4.85, Latrobe and Connellsville. By-product coke is $9.40, Newark; $11, New England; and $9, Philadelphia.

Cincinnati, June 17.—Specifications for by-product foundry coke so far this month fail to show any improvement over May. Prices are steady.

St. Louis, June 17.—Demand for furnace and foundry coke continues quiet. Users are not taking full contract quotas. By-product coke producers have opened books for second half at unchanged prices, but consumers indicate they will buy currently as required.

Birmingham, Ala., June 17.—Less than 195 of the 1390 by-product coke ovens in this district are idle but those active are not being worked to capacity. By-product foundry coke continues $5, base, Birmingham.

Coke Prices

Prices Per Net Ton

Beehive Ovens	
Connellsville furnace	$2.50
Connellsville foundry	3.50 to 4.85
New River foundry	6.00
Wise county foundry	4.25 to 5.00
Wise county furnace	3.50 to 4.25
By-Product Foundry	
Newark, N. J., del.	$9.00 to 9.40
Chicago ovens	8.00
New England, del.	11.00
St. Louis, del.	9.00
Birmingham, ovens	5.00
Indianapolis, del.	8.25
Ashland, Ky., ov., Connell. basis	6.50
Portsmouth, O., ov., Connell. basis	6.50
Buffalo ovens	8.75
Detroit ovens	8.50
Philadelphia, del.	9.00

Ferroalloys

Shipments Are Slower—Ferrotungsten Price Easier

New York, June 17.—Specifications on spiegeleisen contracts are moderately active. Domestic material, 19 to 21 per cent, is steady at $34, furnace, in carload lots. Ferromanganese also is unchanged at $99, duty paid, to users of carloads to 500 tons annually. Shipments of this material have dropped slightly.

Ferroalloys such as vanadium and chrome are unchanged, and specifications are spotty. High-grade ferrosilicon has not been affected by the recent reduction in the low-grade alloy. Tungsten continues weak but nominal, with wolframite available at slightly more than $5, a short ton unit, plus the new duty of $7.93 a unit.

Pittsburgh, June 17.—Little change is noted in current ferroalloy shipments but a decline is noted over a period of a number of weeks. Movement of ferromanganese and spiegeleisen is moderately lower than a month ago while ferrochrome remains in fairly steady demand. Ferrotungsten is slightly more active, with the market lower but steadier at $1.15 to $1.10 a pound. Prices on other grades are unchanged, with ferromanganese continuing $103.79, delivered, for small lots and spiegeleisen $34 on orders up to 100 tons.

Chicago, June 17.—Shipments and specifications of ferroalloys show a further decline from the rate in May. It is understood a cargo of Canadian spiegeleisen is being shipped by water to the Gary district.

Closes Buffalo Plant

Buffalo, June 17.—Massey-Harris Co., Batavia, N. Y., one of the largest consumers of pig iron in this district, will close its plant soon for four to eight weeks. Full operations are not likely to be resumed much before Sept. 1.

Bolts, Nuts, Rivets

Specifications Decline and June Falls Below May

NUT AND BOLT PRICES, PAGE 88

Chicago, June 17.—Specifications for bolts, nuts and rivets are light and much diversified, making execution of orders costly. Third quarter contracting is about half completed and sellers of bolts and nuts report virtually no resistance to prices which are quoted on the basis of 64 to 73 off for bolts and nuts, 3.00c, Chicago, for large structural rivets, and 70 to 70, 10 and 5 off for small rivets.

New York, June 17.—While jobbers are contracting for bolts and nuts for third quarter at the prevailing price of 73 off, some sellers believe these contracts will not be fully specified. End of the current quarter will see much tonnage not specified. Operations are easier at 55 to 60 per cent.

Philadelphia, June 17.—Contracts have been generally renewed through third quarter at 73 off list for bolts and nuts and at 2.90c, base, Pittsburgh, for rivets. Current demand for bolts, nuts and rivets continues at the past few weeks' average and some improvement is expected because structural fabricators who made their own rivets in the 3.10c market are now expected to buy at 2.90c.

Pittsburgh, June 17.—Specifications for bolts, nuts and rivets continue to taper. June business shows a decrease from May, with specifications from jobbers and railroads lighter. Third quarter contracting is under way, with prices steady at 73 off for bolts and nuts, and 2.90c, Pittsburgh, for large rivets.

Cleveland, June 17.—Orders for nuts, bolts and rivets are scarce. Immediate wants alone are covered. Few users have contracted for third quarter.

Ferroalloy Prices

(In dollars, except Ferrochrome)

*Ferromanganese, 78 to 82 per cent tidewater, duty paid	$99.00
*Ferromanganese del. Pittsburgh	103.79
Spiegeleisen, 19 to 21 per cent, domestic furnace spot†	34.00
*Ferrosilicon, 50 per cent, freight allowed, carloads	83.50
*Do, less carload	88.50
Do, 75 per cent	13.00 to 15.00
Ferrochrome, 66-70 chromium, 4-6 carbon, cts. per lb., con., del.	11.00
Do, for spot delivery	11.50
Ferrotungsten, stand., lb. cont.	1.15 to 1.20
Ferrovanadium, 30-40 per cent, per lb., contained, on analysis	3.15 to 3.65
Ferro-carbon-titanium carload producers' plants, net ton	160.00
Do, one ton to carload	170.00
Ferrophosphorus, per ton, carload 17 to 19 per cent, Rockdale, Tenn., basis (18 per cent)	91 00
Ferrophosphorus, electrolytic, per ton carload, 23-25% f.o.b. Anniston, Ala. (24 per cent)	122.50

†Carloads. Differentials apply to large quantities.

*To users of carloads to 500 tons annually. Differentials apply to users of larger quantities.

Scrap

Inactivity Rules as Melters Refuse to Buy—Prices Sink to Somewhat Lower Levels

REDUCED production by steelworks has brought further curtailment of scrap melt and consumers have cut down materially on tonnage. Prices are declining and some have reached the lowest level for eight years. Greater use of pig iron from their own stacks is reducing requirements of steel mills.

Chicago, June 17.—Additional reductions in iron and steel scrap continue. The extent to which steelworks melters are cutting down on scrap consumption with the use of more of their pig iron output is illustrated by the present market. Melting steel shipments are limited and the price range continues at $12 to $12.50. Reports of some speculative interest have been heard, although little direct evidence appears to strengthen the view that melters are preparing to lay down supplies. Prices on many grades are the lowest since 1921. Cast borings at $7.75 to $8.25 have reached the lowest mark in eight years. Industrial scrap is reflecting recent slow fabricating activities, and offerings are lighter. Periodic railroad lists, on the other hand, are near normal for this season.

New York, June 17.—Following reduction at West Mahwah, N. J., dealers here have reduced their buying prices on foundry stove plate to a spread of $7.25 to $7.75, New York. They have also reduced turnings 50 cents a ton to $5.50, New York, and have made a similar reduction on strictly No. 1 melting steel, now of-

Iron and Steel Scrap Prices

Corrected to Tuesday noon. Gross tons delivered to consumers, except where otherwise stated.

Steel Works Scrap

HEAVY MELTING STEEL

Birmingham	10.50 to 12.00
Boston, dealers	9.00 to 9.25
Buffalo, No. 1	13.25 to 14.00
Buffalo, No. 2	11.25 to 11.75
Chicago	12.00 to 12.50
Cincinnati, deal	11.00 to 11.50
Cleveland, No. 1	12.25 to 13.00
Cleveland, No. 2	11.75 to 12.25
Detroit, No. 1 deal	11.00 to 11.50
Detroit, No. 2 deal.	9.50 to 10.00
East Pa., del. mill	13.00 to 13.50
N. Y. deal R. R.	9.00 to 9.50
N. Y. deal No. 2	7.00 to 7.50
N. Y., deal. yd.	6.25 to 6.75
Pittsburgh No. 1	14.75 to 15.25
St. Louis, No. 1 sel.	11.75 to 12.00
Federal, Ill.	11.00 to 11.50
Granite City, Ill.	10.50 to 11.00
Valleys, No. 1	15.50 to 16.00

COMPRESSED SHEETS

Buffalo (dealers)	11.25 to 11.75
Chicago	10.50 to 11.00
Cleveland	12.00
Detroit, dealers	10.50 to 11.00
E. Pa. new mat.	12.00 to 12.50
Pittsburgh	14.75 to 15.25
Valleys	15.00

BUNDLED SHEETS

Buffalo	9.00 to 9.50
Cincinnati, deal.	10.25 to 10.75
Cleveland	9.00 to 9.50
Eastern Pa.	10.00
Pittsburgh	12.50 to 13.00
St. Louis	6.50 to 7.00

SHEET CLIPPINGS LOOSE

Chicago	7.50 to 8.00
Cincinnati	8.00 to 8.50
Detroit, dealers	8.00 to 8.50
St. Louis	6.50 to 7.00

STEEL RAILS SHORT

Birmingham	11.00 to 12.00
Boston, dealers	7.00 to 8.75
Buffalo	16.25 to 16.75
Chicago (3 ft.)	14.00 to 14.50
Chicago (2 ft.)	14.50 to 15.00
Cincinnati, deal.	17.00 to 17.50
Detroit, dealers	15.00 to 15.50
Pittsburgh, (open-hearth, 3 ft. and less)	17.00 to 17.50
St. Louis	16.00 to 16.50

STOVE PLATE

Birmingham	10.00 to 11.00
Boston, consumers	10.00 to 10.50
Buffalo	11.00 to 11.50
Chicago, net	9.50 to 10.00
Cinn., deal. net	8.25 to 8.75
Detroit, net, deal.	9.00 to 9.50
Eastern Pa.	10.00
N. Y., deal., mill	6.25 to 6.50
St. Louis	9.75 to 10.25

COUPLERS, SPRINGS

Buffalo	16.25 to 16.75
Chicago	13.50 to 14.00
Eastern Pa.	18.50 to 19.00
Pittsburgh	17.50 to 18.00
St. Louis	12.50 to 13.00

ANGLE BARS—STEEL

Chicago	13.00 to 13.50
St. Louis	11.25 to 11.75

LOW PHOSPHORUS

Buffalo, billets and bloom crops	17.50 to 18.00
Cleve. billet and bloom crops	17.50
Eastern Pa.	19.50 to 20.00
Pitts. billet and bloom crops	19.00 to 20.00
Pitts. Sheet bar crops	18.50 to 19.00

FROGS, SWITCHES, GUARDS

Chicago	13.00 to 13.50
St. Louis	12.00 to 12.50

SHOVELING STEEL

Chicago	12.00 to 12.50
Cleveland	9.25 to 9.50
St. Louis	10.50 to 11.00

Iron Mill Scrap

RAILROAD WROUGHT

Birmingham	10.00 to 10.50
Boston, dealers	8.00 to 2.25
Buffalo, No. 1	10.00 to 10.50
Buffalo, No. 2	13.50 to 14.00
Chicago, No. 1	11.25 to 11.75
Chicago, No. 2	12.00 to 12.50
Cincinnati, No. 2	11.00 to 11.50
Eastern Pa.	15.00 to 15.50
N. Y., No. 1 deal.	11.75 to 12.00
Pittsburgh, No. 2	14.75 to 15.25
St. Louis, No. 1	10.00 to 10.50
St. Louis, No. 2	11.00 to 11.50

SPECIFICATION PIPE

Boston	8.00 to 8.50
Eastern Pa.	12.50
New York, deal.	7.75 to 8.25

BUSHELING

Buffalo, No. 1	11.50 to 13.00
Chicago, No. 1	10.00 to 10.50
Cinn., No. 1 deal.	9.25 to 9.75
Cinn., No. 2	6.25 to 6.75
Cleveland, No. 2	8.50 to 9.00
Detroit, No. 1 new deal.	9.75 to 10.25
St. Louis, No. 1	9.50 to 10.00
Valleys, new No. 1	15.00

MACHINE SHOP TURNINGS

Birmingham	7.50 to 8.50
Boston, dealers	4.25 to 4.50
Buffalo	8.75 to 9.00
Chicago	6.50 to 7.00
Cincinnati, deal.	7.50 to 8.00
Cleveland	8.00 to 8.50
Detroit	6.25 to 6.75
Eastern Pa.	9.00
New York, deal.	5.50
Pittsburgh	9.50 to 10.00
St. Louis	6.75 to 7.25
Valleys	11.25 to 11.75

MIXED BORINGS, TURNINGS
For blast furnace use

Boston, dealers	3.50 to 4.00
Buffalo	9.75 to 10.00
Cincinnati, deal.	8.00 to 8.50
Cleveland	9.25 to 9.50
Detroit, dealers	7.50 to 7.75
Eastern Pa.	8.50 to 9.00
New York, deal.	5.00
Pittsburgh	10.00

CAST IRON BORINGS

Birmingham, chem.	12.00 to 13.00
Birmingham, plain	7.50 to 8.50
Boston, chem.	9.00 to 9.50
Boston, dealers	4.10 to 4.50
Buffalo	9.75 to 10.00
Chicago	7.75 to 8.25
Cincinnati, deal.	8.00 to 8.50
Cleveland	9.25 to 9.50
Detroit, dealers	7.50 to 7.75
Eastern Pa.	10.00
Eastern Pa., chem	14.00 to 14.50
New York, deal.	6.50
Pittsburgh	10.00
St. Louis	9.25 to 9.50

PIPE AND FLUES

Cincinnati, deal.	9.00 to 9.50

RAILROAD GRATE BARS

Buffalo	9.50 to 10.00
Chicago, net	9.00 to 9.00
Cincinnati	9.00 to 9.50
Eastern Pa.	11.00
New York, deal.	7.75
St. Louis	10.25 to 10.50

FORGE FLASHINGS

Boston, dealers	7.00 to 7.50
Buffalo	11.25 to 11.75
Cleve. over 10 in.	10.50 to 11.00
Detroit	9.75 to 10.25

FORGE SCRAP

Boston, dealers	7.00 to 7.50
Chicago	14.50 to 15.00
Eastern Pa.	12.50 to 13.00

ARCH BARS AND TRANSOMS

Chicago, net	13.75 to 14.25
St. Louis	15.00 to 15.50

Iron, Steel Works Scrap

AXLE TURNINGS

Boston, deal.	6.75 to 7.00
Buffalo	12.00 to 12.50
Chicago steelworks	9.50 to 10.00
Cleveland	12.00 to 12.25
Eastern Pa.	11.00 to 12.00
Pittsburgh	13.00 to 13.50
St. Louis	9.25 to 9.75

STEEL CAR AXLES

Birmingham	19.00 to 20.00
Boston, ship point	15.50 to 16.00
Buffalo	16.00 to 16.50
Chicago	16.80 to 17.35
Eastern Pa.	22.00
St. Louis	16.50 to 17.00

SHAFTING

Boston, ship point	12.50 to 13.00
Chicago	16.25 to 16.80
Eastern Pa.	18.00 to 18.25
New York, deal.	13.00 to 14.00
St. Louis	16.00 to 16.50

Iron Foundry Scrap

CAR WHEELS

Birmingham, iron	10.00 to 11.00
Boston, iron	14.00 to 14.50
Buffalo, iron	13.25 to 13.75
Buffalo, steel	16.25 to 16.75
Chicago, iron	13.50 to 14.00
Chi., rolled steel	15.00 to 15.50
Cincinnati	12.00 to 12.50
N. Y., iron, deal.	10.50 to 11.00
Pittsburgh, iron	15.50 to 16.00
Pittsburgh, steel	17.50 to 18.00
St. Louis, iron	12.50 to 13.00
St. Louis, steel	14.00 to 14.50
East Pa. steel	18.50 to 19.00
East Pa. iron	15.00

NO. 1 CAST SCRAP

Birmingham, cup.	12.00 to 13.00
Buffalo	12.00 to 12.50
Boston, textile	11.50 to 12.50
Chicago, mach.	14.00 to 14.55
Chicago, railroad	11.20 to 11.75
Chicago, agri.	11.20 to 11.75
Cincinnati, mach. cupolas, gross	17.75 to 18.25
Cleveland, cupola	14.00 to 14.50
Detroit, net deal.	10.00 to 10.50
East Pa. cupola	14.50 to 15.00
N. Y. cup. deal.	10.25
N. Y., del. local foundries	15.00
Pittsburgh, cupola	14.00 to 14.50
San Fran., del.	13.50 to 14.00
Seattle	14.00 to 14.25
St. L. No. 1 mach.	12.50 to 13.00
St. Louis, No. 1	11.50 to 12.00

HEAVY CAST

Boston	10.50 to 11.00
Boston, mach. cast	14.00 to 14.50
Buffalo, breakable	8.50 to 9.00
Cleve., breakable	9.00 to 9.50
Detroit, auto, net Dealers	11.50 to 12.00
Det., break., deal.	7.00 to 7.50
Eastern Pa.	12.25 to 12.75
N. Y. No. 1 deal.	9.25 to 9.50
N. Y. break. deal	8.00 to 9.00
Pittsburgh	11.00 to 11.50

MALLEABLE

Boston, railroad	15.00 to 15.50
Buffalo	15.50 to 16.00
Chicago, agri.	12.50 to 13.00
Chicago, railroad	13.50 to 14.00
Cinn., R. R. deal.	15.25 to 15.75
Cinn., agri., deal.	14.25 to 14.75
Cleveland, rail	16.00 to 16.50
Detroit, auto deal.	13.50 to 14.00
St. Louis, rail	13.00 to 13.50

Miscellaneous Scrap

RAILS FOR ROLLING
5 feet and over

Birmingham, cup.	12.00 to 13.00
Boston	9.00 to 9.50
Buffalo	13.50 to 14.00
Chicago	14.50 to 15.00
Eastern Pa.	15.00 to 15.50
New York	10.00 to 10.50
St. Louis	12.50 to 13.00

LOCOMOTIVE TIRES

Chicago, cut	15.00 to 15.50
St. Louis No. 1	13.00 to 13.50

LOW PHOS. PUNCHINGS

Chicago	13.50 to 14.00
Pittsburgh	17.50 to 18.00
Eastern Pa.	18.00 to 19.00
Buffalo	17.00 to 17.50

fering $10 on barge for Buffalo and $9.50 for Bridgeport, Conn.

Boston, June 17.—While iron and steel scrap shows little improvement, some Pittsburgh mills appear anxious to buy heavy melting steel, the price of which has displayed a firmer trend in the past week or so. While no bidding is going on considerable can be sold, but local interests are not anxious to sell at prevailing prices.

Philadelphia, June 17.—Several sales have been made of yard steel at $10.50 to $10.75, while No. 2 melting steel ranges at $10.75 to $11. No new sales have been made of No. 1 heavy melting steel, which remains $13 to $13.50, delivered. Stove plate and turnings are lower on new sales.

Buffalo, June 17.—There is an inquiry for 1800 tons of No. 1 machinery cast for Buffalo district delivery. Specifications are so rigid that dealers are in no haste to quote. All other lines are quiet with prices mostly nominal. Niagara Falls offers for machine shop turnings have been further reduced to $10.25, delivered, and there is no general buying at this price. Yard operation continues slow.

Pittsburgh, June 17.—Prices for iron and steel scrap are easier with demand light. Heavy melting steel is quotable 25 cents lower at $14.75 to $15.25, with further sales lacking at $15.50, although dealers are unable to pick up large tonnages for most points at less than $15. Blast furnace material is lower on a sale of $10. Low phos grades are quiet but weaker.

Cleveland, June 17.—Activity in iron and steel scrap shows further recession this week with the closing down of one important steelworks and reduced operations of others. Consumer buying is entirely lacking with mills showing no interest. Dealers are taking little material for shipment against orders. Demand for foundry grades also has tapered. Prices are nominally unchanged with the exception of shoveling steel turnings, now quoted on the same basis as borings and turnings.

Cincinnati, June 17.—Iron and steel scrap prices remain unchanged. Demand is low and buyers continue pressure on prices. Bidding on recent railroad lists was considered good and supplies from this source are proving adequate.

Detroit, June 17.—Sentimentally iron and steel scrap prices are weak, though prices are nominally unchanged in absence of trading. With summer shutdowns supplies from producers will be small for some time and prices seem likely to remain unchanged.

Birmingham, Ala., June 17.—Quotations on iron and steel scrap are weak; supplies are sufficient for all needs. Heavy melting steel is unchanged at $10.75 to $12, delivered.

St. Louis, June 17.—Buying activity in iron and steel scrap is confined chiefly to brokers who still have orders to fill. The volume of such unfilled orders, however, is rapidly declining, and unless new business is forthcoming shortly things will be at a standstill. Singularly enough, despite lack of consumer buying, railroads recently have been receiving good prices. Bidding has been brisk, and all lists promptly sold. Some items brought higher figures than those quoted in dealers' lists.

Toronto, Ont., June 17.—Canadian iron and steel scrap markets have shown little change. Iron scrap sales are holding up to expectations, with machinery cast in good demand for spot and future delivery. Steel scrap is dull with limited buying. Releases against contract are responsible for a good flow of scrap. Prices are unchanged.

Canadian Scrap

Dealers' Buying Prices

MONTREAL
Per Gross Ton

Iron axles	$19.00
Steel axles	17.00
Car wheels	14.50
Stove plate	12.00
Wrought pipe	6.00
Turnings	6.50
Heavy melting steel	8.00

TORONTO

Steel axles	14.00
Iron axles	16.00
Heavy melting steel	9.00
Turnings	7.00
No. 1 mach. cast (net)	15.00
Malleable (net)	11.50

Semifinished Steel

Market More Clearly Defined at $31—Business Slow

SEMIFINISHED STEEL PRICES, PAGE 88

Pittsburgh, June 17.—New buying and contracting in semifinished steel remain slow. The market is fairly well defined at $31 for rerolling billets, sheet bars and slabs, with forging billets continuing at $37. The market on the latter, however, has not been tested. Specifications from sheet and strip mills are slow. Wire rods are slightly less active, but steady at $36.

Cleveland, June 17.—The leading merchant producer of sheet bars, billets and slabs has dropped two more open hearths, now operating six of 14. Consumers will continue to order material in the third quarter as requirements arise at prices prevailing at time of delivery. Sellers offer sheet bars, billets and slabs at $31, base, Cleveland or Youngstown.

Chicago, June 17.—Quotations of $32 to $33, base Chicago, are reported for billets, blooms and slabs. Buying is light, but shipments are fair. A moderate demand is maintained for forging billets which are quoted $37, base Chicago. Wire rods are $37, Chicago.

Philadelphia, June 17.—Several sales of billets were closed here in the past week at $32, base, Pittsburgh, for rerollers, and $37 for forging.

Youngstown, O., June 17.—Slowing of independent sheet and strip mill activities has resulted in further slight reduction of independent open-hearth operations. These average 51 per cent, against 53 per cent last week. Bessemer production is around 55 per cent. Small sales of sheet bars, billets and slabs are noted at $31, Pittsburgh and Youngstown.

Operating Rates

Operations Drop Sharply as Cleveland, Chicago Touch Low Marks

Cleveland—Steelmaking suffered a severe drop, to 50 per cent, with only 17 of 34 open-hearth furnaces pouring. Bourne-Fuller unit of Republic Steel Corp. has closed its stack for relining, its five open hearths as well, and all steel for finishing here is being brought in temporarily from other Republic units. Corrigan, McKinney Steel Co. has six of 14 open-hearth furnaces on; Otis Steel Co. five of eight. American Steel & Wire Co. presents the best picture, with six of seven open hearths on.

Youngstown, O.—Except departments making tubular goods, steel mill activities are lower. Slightly reduced steel output and an almost general suspension of sheet mill operations brings average of all operations to about 62 per cent. Independent steel output shows 27 open hearths out of 51 and 60 per cent of bessemer capacity engaged. Steel corporation plants are operating 65 to 70 per cent. Of 120 independent sheet mills, less than 50 are scheduled this week. Strip output is not above 65 per cent. Independent tin plate production is about 50, that of the Steel Corporation 70. Independent bar mills are operating 60 per cent and those of the Steel corporation 70. Pipe mill operations show an increase from 60 to 75 per cent.

Birmingham, Ala.—Steelmaking is at 60 per cent, with 14 open-hearth furnaces out of 23 in operation. Fifteen blast furnaces are active. Tennessee Coal, Iron & Railroad Co. has blown out a blast furnace and banked another at Ensley, Ala; six open hearths and a rail mill have also been closed. Steel fabricating shops have stopped night work and are working four and five days a week. Sheet and plate mills at Fairfield, Ala., are operating at better than 50 per cent.

Buffalo—Steelworks operations show a gain this week, advancing from 73 to 75 per cent. Bethlehem's Lackawanna plant continues to operate at close to capacity and is holding up the other steelworks in the average.

Chicago—Ingot capacity is about 70 per cent, a drop of five points. Illinois Steel Co. has blown out No. 4 furnace at South Chicago for relining, leaving 14 of its 27 furnaces blowing. Inland Steel Co. has four active at Indiana Harbor, but after building up pig iron reserve stocks may reline one later in the summer. All finishing mill activity has declined except plate and sheet rollings. Youngstown Sheet & Tube Co. has banked its No. 1 furnace at Indiana Harbor.

Pittsburgh—Steelmaking operations are steady at 70 per cent. Sheet output is lower at 50 to 55, with tin plate 75 to 80. Strip is off at 60 to 65, with pipe unchanged at 75.

Bars

Production Less as Users Cover Only Necessary Small Lots—Future Buying Light

SOFT steel bar demand is confined to the barest requirements of users and offers of contracts for third quarter meet little response. Implement makers are in the usual summer slack period in the West and this has reduced activities at Chicago. Buying is at a lower rate than that of May. Prices are fairly steady. Automotive requirements will be lower in July.

BAR PRICES, PAGE 87

Chicago, June 17.—Bar mill operations, at about 70 per cent, have been further reduced, due in part to general slowing down in the implement industry. Inventory and repair periods for implement and tractor works this year are expected to continue at least through July. Miscellaneous bar orders are fair, sporadic gains making for a volume of sales and specifications similar to the last few weeks. Road building and excavating machinery builders now are leading farm equipment. Mills, by adjusting rolling cycles to meet customers' schedules wherever possible, are able to provide fairly prompt deliveries on most bar sizes. Third quarter books are open, but customers fail to consider coverage for that period, and mills are willing to let contracting take its logical course. Soft steel bars remain 1.85c, base, Chicago. Bar iron continues 1.90c.

New York, June 17.—The steel bar market is marking time, with consumers' inventories low and buyers covering from hand to mouth. Meanwhile, 1.75c, Pittsburgh, appears steady with shipments ranging two to three weeks.

Philadelphia, June 17.—Steel bar demand is slow. Prices continue 1.75c to 1.80c, base, Pittsburgh. Iron bars have a range of 1.70c to 1.75c, base, Pittsburgh.

Common iron bars here show a somewhat heavy volume of demand and prices are steady at 1.70c to 1.75c, base, Pittsburgh, most current orders bringing the latter.

Pittsburgh, June 17.—Bar demand continues to taper slowly from the May rate. Specifications continue in small lots with requirements of cold bar finishers reflecting seasonal quiet in automotive demand. Producers are taking third quarter contracts at 1.75c, Pittsburgh, although this demand is light. The market continues fairly steady at this figure.

Youngstown, O., June 17.—Former dullness in new business in steel bars apparently is being accentuated. Independent mills are less than 60 per cent active and Carnegie Steel district mills about 65 per cent active. Railroads and implement manufacturers seem to have bought and taken in about all the bar tonnage they need in northern Ohio. Carload lots of steel bars are going at 1.75c, Pittsburgh.

Cleveland, June 17.—Soft steel bar orders for June to date parallel those of the same period of May. The prospects, however, are that June will close poorly. Automotive needs continue to shrink. Interest in third quarter is mild, with mills willing to quote today's prices for that delivery. Local mills usually quote 1.80c, Cleveland, for local delivery and 1.75c, Cleveland, for outside shipment, levels which outside mills meet.

The treasury department, Washington, has announced allowance of drawback on galvanized steel and iron sheets manufactured by the Newport Rolling Mill Co., Newport, Ky., with the use of imported spelter.

Safety Trophy Won by Berkshire Iron Mine

The Berkshire iron ore mine at Stambaugh, Mich., operated by Oglebay, Norton & Co., has been awarded the "Sentinels of Safety" bronze trophy for 1929 The Berkshire mine worked 345,695 man-hours without a lost-time accident during the year, and its accident rate was zero. The combined accident-severity rate for all of the 54 metal mines which competed for the trophy was 5.99 and the combined frequency rate was 52.162. Anthracite, bituminous coal, nonmetallic mineral mines, quarries and open-cut mines also participated in the contest, a trophy being awarded in each of the five divisions by the *Explosive Engineer*. The average of all their severity rates was 9.258, and the average of the frequency rates was 66.346. The contest is conducted by the bureau of mines.

Plates

More Mills Reaffirm Prices for Third Quarter—8000 Tons Placed for Southwestern Refinery Work

PLATE mills are reaffirming present prices for the third quarter but the response from buyers is not especially encouraging. Current requirements of a miscellaneous character continue fairly active. Chicago mills continue operating at 85 per cent. New orders for 8000 tons of plates for southwestern refinery work were booked. Pipe and ship work feature the East.

PLATE PRICES, PAGE 87

Chicago, June 17.—Tank and pipe line work are supplying the only substantial plate mill bookings. Operations continue at about 85 per cent, with deliveries in three to four weeks. A local fabricator booked about 8000 tons of tank plates for southwestern refinery work, and about 1200 tons are on inquiry. It is understood Phillips Petroleum Co. will require large tonnages of tank plates for storage stations along its proposed line, but it is not certain that even a part of the order will be closed soon. Mills are making no attempt to force third quarter business, but are ready to take bookings at 1.80c, Chicago.

New York, June 17.—Plate sellers are reaffirming present prices of 1.80c to 1.85c, Coatesville, for third quarter, with the usual concessions of $1 or more a ton on ship and railroad work. The general volume of plate business is showing some improvement. Among active requirements at this time are 2500 tons for reconditioning five vessels for the Roosevelt Lines, on which bids went in June 9, and 1000 tons of 30-inch steel pipe for the local department of water supply, gas and electricity, on which bids were closed June 20. The department is expected to announce action today on 500 tons of 48-inch pipe for the Bronx, on which Culligan & Co., Bayonne, N. J., are low bidders.

Pittsburgh, June 17.—Plate tonnage continues light. Recent specifications are off moderately from the rate of early June and a month ago. Most leading consumers are taking smaller tonnages although requirements of fabricators are maintained fairly well. Third quarter contracting is dull with the market generally unchanged at 1.70c, Pittsburgh, despite continued reports of concessions.

Cleveland, June 17.—The number of plate orders is fair but the volume is low. Diversity continues to characterize demand. Interest in third quarter is slow. The 1.70c, Pittsburgh, price is named.

Philadelphia, June 17.—Plate demand is maintained at the improved rate of the past several weeks, eastern mills operating at 50 to 90 per

cent. The market shows more life. Several large projects are being lined up for closing in July. The price is unchanged at 1.80c, base, Coatesville, subject to differentials, particularly where plates are purchased with shapes and bars.

CONTRACTS PLACED

375 tons, pipe line project, Everett, Wash., to Western Pipe & Steel Co., San Francisco, through J. W. Hoover, general contractor.

CONTRACTS PENDING

2200 tons, penstock for irrigation project Vale, Oreg. Bids opened June 9.
1000 tons, 30-inch pipe, department of water supply, gas and electricity, New York. Bids June 20.
500 tons, 48-inch pipe, department of water supply, gas and electricity, New York. Culligan & Co., Bayonne, N. J., low on general contract.
250 tons barges for Foss Co., Seattle. General contract to Lake Washington Shipyards, Seattle.

Machine Tools in Slump

Cincinnati, June 17.—All classifications of machine tool orders declined sharply in May. The index of total actual orders at 135.1 was the lowest since November, 1927; the 3-months average at 165.1 was low for at least 17 months. Unfilled orders and shipments were also off for the month and cancellations rose, accordingly to the National Machine Tool Builders' association. Following show order averages:

1929	*Index A	*Index B	*Index C	*Total
January	286.6	278.3	294.2	285.6
February	303.2	285.7	330.6	300.8
March	321.4	319.6	330.8	320.8
April	330.1	328.5	349.3	330.0
May	328.2	330.7	354.9	329.5
June	315.6	308.4	346.4	315.2
July	296.2	284.6	324.6	294.8
August	284.2	279.7	272.6	286.1
September	268.5	258.6	252.3	265.8
October	295.4	263.0	269.0	287.0
November	250.8	235.7	261.2	247.2
December	224.0	212.7	258.3	222.1
1930				
January	173.3	171.9	226.8	175.4
February	170.3	169.1	213.6	172.6
March	172.8	184.0	219.7	177.8
April†	167.6	197.7	214.4	176.8
May	155.2	191.2	195.3	165.1

†Revised.

*Note—Index A, base more than $50,000; Index B, base $10,000 to $50,000; Index C, base less than $10,000. Base: average shipments for years 1922-23-24. Totals: The total of all reports is not an average of A, B and C, but represents the total sum of each item in percentage of the total base.

Merritt L. Wolfe Dies

Merritt L. Wolfe, 42, secretary of Berger Bros. Co., Philadelphia, died at Ocean City, N. J., June 13, after a lengthy illness.

Hillside Is Shipping

Despite the cavein of the water tower at the mines of the Hillside Fluorspar Co. at Rosiclare, Ill., shipments are being continued, out of stock, and full operations will be resumed in six days, according to G. H. Jones, president, of Chicago.

Pipe

Gulf Oil Awards 100,000-ton Line —Cast Projects Small but Numerous—Prices Firm

ANOTHER 100,000-ton pipe line placed with National Tube Co. heightens interest in steel line pipe. Advertised projects requiring cast pipe are fairly numerous in the 100 to 500-ton range. A 7 and 9-foot diameter tunnel under Harlem river, N. Y., will take 520 tons. Intermittent private and contractor business represents fair aggregate. Prices are unchanged.

PIPE PRICES, PAGE 88

New York, June 17.—Several thousand tons of cast pipe are pending. Bids are in on general contracts. This includes lines at Beacon, N. Y., and for the Newcastle water district. Bids will be taken June 30 on two and a quarter miles of 10 and 24-inch cast pipe for New Rochelle and Scarborough, N. Y. Queens will take 300 tons of 30-inch pipe, opening bids June 24 on the general contract. On the same date about 150 tons of 30 and 24-inch and smaller sizes will be opened for the Bronx. Prices are firm on a basis of $37, eastern foundry.

Boston, June 17.—Nearly 1500 tons of pipe were sold in this district last week. Massachusetts awarded Donaldson Iron Co. 100 tons of water pipe and 350 tons of gas pipe. Gloucester, Mass., bought 200 tons and Bucksport, Me., awarded Warren Foundry & Pipe Co. 800 tons. Amherst, Mass., opens bids June 24 on 200 tons. Price situation is firm at $36 to $37 a ton.

Pittsburgh, June 17.—Most large line pipe projects have now taken the form of orders on pipe producers' books. A 900-mile line for the Gulf Oil Corp. of Pennsylvania has been formally announced. It will be laid for Union Gulf Corp., a subsidiary, from eastern Oklahoma to Pittsburgh, and will comprise 700 miles of 10-inch and 200 miles of 12-inch, about 100,000 tons. The pipe order was placed with National Tube Co. a short time ago. Pending projects include the Standard Oil Co. line from Tulsa, Okla., to St. Louis and a line for the Columbia Gas & Electric Corp. Lapweld mills continue well engaged against heavy orders already on books but buttweld pipe continues slow. Demand for oil country goods remains spotty as the result of oil conservation programs in western fields. Demand for other tubular products remains seasonally slow. Mill operations continue 75 per cent.

Cleveland, June 17.—Buttweld pipe orders are fewer. Jobbers are not disposing of their stocks because so little building is in progress. Lapweld mills are filled up until November and December. Youngstown Sheet & Tube Co. expects shortly to be able to furnish electric welded pipe up to 26 inches in diameter.

Chicago, June 17.—Intermittent private and contract orders for cast pressure pipe are running into a good average sales volume. Little prospect is seen for municipal work in the near future. The Chicago inquiry of 200 to 500 tons, and an inquiry for 17,000 feet of 6 and 12-inch pipe for Canton, O., in addition to several smaller Ohio and Michigan jobs, comprise the leading advertised work. Zion, Ill., placed 200 tons of small sized pipe. Prices are nominal for municipal work.

Birmingham, Ala., June 17.—New cast pipe business is light. Contracts on books show a noticeably decrease. Curtailment of production is probable in the next two weeks or so, though several specifications are reported in sight. Shipments are steady. Larger shops have maximum operations for five days weekly.

CONTRACTS PLACED

800 tons, 6 to 16-inch cast pipe, Bucksport, Me., to Warren Foundry & Pipe Co., Phillipsburg, N. J.
350 tons, cast gas pipe for Massachusetts, to Donaldson Iron Co., Emaus, Pa.
250 tons, 10 and 12-inch centrifugal cast iron pipe for North Grafton, Mass., to R. D. Wood & Co., Florence, N. J.
200 tons, 4, 6 and 8-inch cast pipe for Zion, Ill., to American Cast Iron Pipe Co., Chicago.
200 tons, 6 to 12-inch last pipe, Gloucester, Mass., to United States Pipe & Foundry Co., East Burlington, N. J.
100 tons, cast water pipe for Massachusetts, to Donaldson Iron Co., Emaus, Pa.
Unstated tonnage, 20,000 feet, 6-inch cast pipe, for St. Louis, to McWane Cast Iron Pipe Co.

STEEL PIPE PLACED

100,000 tons, 900 miles 10 and 12-inch steel pipe, Gulf Oil Corp. of Pennsylvania, line from Oklahoma to Pittsburgh, to National Tube Co., Pittsburgh.

CONTRACTS PENDING

350 tons, 4 to 8-inch class 150, improvement of Main street, Santa Ana, Calif.; bids opened.
384 tons, 6 to 16-inch class B, improvement of Moreno boulevard, San Diego, Calif.; bids opened.
300 tons, 30-inch cast pipe, for Queens, N. Y.; bids June 24, contractor's letting.
265 tons, 12 and 16-inch class B, San Francisco; bids opened.
520 tons, 7 and 9-foot diameter cast pipe, telephone line tunnel under Harlem river, New York.
200 tons, 8 and 10-inch cast pipe, Amherst, Mass.; bids opened June 24.
153 tons, 6 and 8-inch class B, improvement of Sixty-seventh street, Long Beach, Calif.; bids June 13.
150 tons, 30 and 24-inch cast pipe, also some smaller sizes, for Bronx, N. Y.; bids June 24, contractor's letting.
110 tons, 4 to 8-inch, class 150 cast pipe, improvement for district No. 140. Fullerton, Calif., general contract to S. M. Milovich,

Fullerton.
Unstated tonnage, 17,000 feet, 6 and 12-inch cast pipe for Canton, O.; bids June 20.
Unstated tonnage, 11,880 feet, 10 to 24-inch cast pipe, for Westchester County Sanitary Sewer commission at New Rochelle and Scarborough, N. Y.; bids June 30.

Tin Plate

Shipments Ahead of Rate in May—Operations Are Steady

TIN PLATE PRICES, PAGE 88

Pittsburgh, June 17.—Tin plate shipments continue slightly ahead of the May tonnage. Specifications are fairly good but show little change from those of recent weeks. Favorable reports are heard regarding the California fruit pack. Operations remain steady at slightly above 75 per cent. The market continues $5.26, Pittsburgh, per base box.

Iron Ore

Consumption Increases Moderately—Price Cut Not Considered

IRON ORE PRICES, PAGE 88

Cleveland, June 17.—Consumption of Lake Superior iron ore in May amounted to 4,715,379 tons, according to the current report of the Lake Superior Iron Ore association. The increase over April was 139,854 tons. The decrease from May, 1929, was 1,264,869 tons. Ore on hand at lower lake docks and furnaces June 1 amounted to 21,324,837 tons, 2,178,963 tons more than on June 1, 1929. Movement of ore is gaining slowly and a late season is anticipated. Easier tone in iron and steel markets has raised the question whether there is likely to be a reduction in iron ore prices. The great bulk of tonnage is mined and consumed by associated interests and prices for the season have been written into contracts. A price reduction is not being considered, producers say, because consumers realize it would tend further to depress iron and steel prices. The small tonnage not yet closed in the open market is not an important factor.

New York, June 17.—North African low phosphorus iron ore has been reduced a half cent to 10.50c per unit, alongside docks, Atlantic ports. Spanish and North African basic, 50 to 60 per cent, also is slightly easier, with the prevailing range 9.50c to 10c. All other ores, including manganese are, are unchanged.

Approve Sheffield Sale

Stockholders of the Sheffield Steel Corp., Kansas City, Mo., June 16 voted formal approval of the merger with the American Rolling Mill Co., Middletown, O. A meeting is to be held June 24 to vote the dissolution of the Sheffield corporation and authorize distribution of the American Rolling Mill Co.'s stock received for the corporation.

Sheets

Gradual Reduction Noted in Orders and Operations—Specifications Better in Some Districts

FURTHER recession is evident in the volume of new sheet business, though contract specifications at Pittsburgh and Chicago are fair. Operations continue to decline; in the Mahoning valley they are slightly below 40 per cent. Some makers of autobody sheets are turning to the manufacture of other specialties. Consumers show no inclination to cover third quarter requirements.

SHEET PRICES, PAGE 87

Pittsburgh, June 17.—Sheet business has tapered further and the immediate outlook remains dull. Automotive requirements are slipping gradually and with several companies planning to shut down during July for at least two weeks, prospects point to further reduction in tonnage. Operations have declined to 50 to 55 per cent, with the leading interest slightly above 55 per cent. Specifications are small and delivery is becoming as important a factor in obtaining orders as prices. Stocks of practically all consumers are at a minimum. Producers are not anxious to obtain new contracts due to the fact buyers thus obtain protection against higher prices. Current prices generally are 2.55c for black sheets, 3.20c for galvanized, 2.15c for blue annealed sheets, and 2.00c for blue annealed plates. On galvanized sheets eastern jobbers are understood occasionally to receive a preferential below the usual 3.20c price to consumers.

New York, June 17.—Slack buying is making for further weakness in sheets. While galvanized sheets for the manufacturing trade continue generally 3.20c, base, Pittsburgh, prices to jobbers are noted as low as 3.10c. Black sheets are 2.55c, subject to concessions of $1 a ton. Blue annealed plates and sheets are 2.00c and 2.15c, respectively.

Philadelphia, June 17.—Sheet demand is maintained at the recently improved level. Blue annealed prices continue firm at 2.00c, base, Pittsburgh, for heavy gages, and 2.15c for the light. Black sheets are 2.55c, subject to occasional concessions, and galvanized sheets are unchanged at 3.15c. Strip sheets now generally are 1.80c, base, Pittsburgh, on the blue annealed basis, plus a $3 differential for light gages.

Cleveland, June 17.—Sheet specifications are further curtailed and requests to delay shipments particularly to automotive consumers, are more numerous. Ford and Chevrolet and their parts makers are taking less than recently. Ford is believed to be holding up material preparatory to a two-weeks vacation in July. Chevrolet's position is best gaged by the fewer releases from the local plant of the Fisher Body Co. Last week it made only 16,000 to 18,000 units as against a recent high of 28,000. Chevrolet will continue to recede through July and into August and will then shut down for six weeks to bring out its new model. Autobody sheets are 3.60c to 3.70c; black, 2.45c to 2.55c; galvanized, 3.15c to 3.20c; metal furniture, 3.70c to 3.80c, and blue annealed 2.15c for No. 13 gage, base, Pittsburgh. Some sellers find the present period duller than any in ten years.

Youngstown, O., June 17.—The volume of new sheet business continues to decrease. About 47 of the 120 independent sheet mill units are operating slightly less than 40 per cent of capacity. Entire plants are idle at Niles, Leavittsburg and Warren, O. Demand from makers of automotive parts has dropped. Some mills are swinging into production of specialties such as stainless, electrical and other grades. Autobody sheets are quoted at 3.70c, Pittsburgh, but all makers are not firm at that price. Common black sheets are 2.55c, and galvanized 3.20c, with valley mills holding to these levels more firmly than a week ago.

Cincinnati, June 17.—Radio manufacturers are placing orders for future requirements. Otherwise the market is quiet. Prices show a firmer tendency.

St. Louis, June 17.—Seasonal influences are accentuating quietness in the sheet market. Galvanized material is moving slowly. Prices are steady.

Chicago, June 17.—Sheet mills are maintaining operations at about 65 per cent, with small backlogs. Demand for galvanized roofing is expected to be more active within 30 to 40 days. Blue annealed sales are well diversified. Occasional price concessions are reported, but mill quotations mainly are on the basis of 2.65c for No. 24 black; 3.30c for No. 24 galvanized; and 2.10c to 2.20c for No. 10 blue annealed.

Sell Spang-Chalfant?

Pittsburgh, June 17.—Reports are prevalent that control of Spang, Chalfant & Co. Inc., Pittsburgh, will be acquired by new interests. The company at present is one of the Hillman holdings. Spang-Chalfant operates two plants producing welded and seamless pipe and recently has been improving its welded mill at Etna, Pa., through installation of new equipment. Common stock of Spang-Chalfant has been active and strong the past few days.

Structural Shapes

Diversification Characterizes Awards, Also Inquiries—20,000 Tons Advertised for New York Subways—Contracting Dull

VARIETY continues to mark structural steel lettings and inquiries. An office building, 4000 tons; pumping plant, 1860 tons; department store, 1800 tons; bridges, 1500, 1315 and 1000 tons; industrial plants, 1500 and 1000 tons; power plants, 1240 and 1000 tons; church-apartment, 1000 tons—all are included in the week's awards. Subways at New York will take 20,000 tons; a school at Brooklyn 10,000 tons; an automobile plant in California 4400 tons. An office building, 1400 tons; bridges, 1700 and 1000 tons; a bank, 4000 tons; and a World's Fair building at Chicago, 1500 tons, also are up. Rolling schedules in structural mills increasingly accommodate consumers' wishes. Little interest has been aroused in third quarter. Open market prices are based on 1.70c, Pittsburgh.

STRUCTURAL SHAPE PRICES, PAGE 87

New York, June 17.—Structural shape lettings were lower here this week. More small jobs were placed. Two subway sections are being advertised to take more than 20,000 tons. The Brooklyn, N. Y., technical high school plans still are uncertain, but steel is estimated at close to 10,000 tons. Pending work continues heavy, some of which is maturing slowly. Additions for Bank of Manhattan and Goldman-Sachs buildings, both erected within the last year, are under way, requiring several thousand tons of shapes. This tonnage, however, was included in the original contracts with Levering & Garrigues for the bank and American Bridge Co. for Goldman-Sachs. Prices, still easy, incline toward steadiness. New York Central is inquiring for its third quarter shapes, plates and bars.

Boston, June 17.—Structural awards continue in small volume throughout the district. A few large jobs are pending, including 500 tons for the Brown building at Waterbury, Conn., and 1000 tons for a county bridge at Tyngsboro, Mass.

Philadelphia, June 17.—Demand for plain shapes shows further improvement and eastern shape mill schedules are better. Plain standard shapes continue 1.70c to 1.80c, base, eastern mill, as a rule with less on attractive lots.

Pittsburgh, June 17.—The fabricated structural steel market has quieted both in awards and in inquiry. Most pending jobs involve small tonnages. Plain material remains fairly steady at 1.70c, Pittsburgh, but there has been no rush to cover for third quarter.

Cleveland, June 17.—Specifications for plain shapes are not showing much improvement. Awards are few. Inquiries are light. Not many third quarter contracts have been closed. The 1.70c, Pittsburgh, price appears in the open market but large users get a differential under that.

Chicago, June 17.—Structural mill operations again have dropped slightly to about 70 per cent. Rolling cycles now are made to accommodate needs of buyers to a greater extent than at any time this year. Shipments are prompt to three weeks. Shipments of light shapes for the Chesapeake & Ohio car orders, as well as other finished steel, will be completed by one producer this month, but another mill will carry these shipments well into July. Despite a standstill in commercial building in the Chicago area, fresh inquiries, largely public works and bridge work, total about 7000 tons. In addition, preliminary projects, such as the 4000 tons for the National Bank of the Republic, Chicago, are being considered. Mills are ready to take third quarter business on the recent price level of 1.80c, Chicago.

Birmingham, Ala., June 17.—New shape specifications are scarce and night work at fabricating shops has been eliminated. Several 100-ton or less contracts are being worked up without delay. Ingalls Iron Works Co. received 150 tons for a Superior Earth Co. job at Ocala, Fla., and 100 tons for a foundry extension for Goslin-Birmingham Mfg. Co., Birmingham. Early improvement in structural steel demand is not expected.

CONTRACTS PLACED

4000 tons, piers, Erie railroad, Jersey City, N. J., to Truscon Steel Co., Youngstown, O., through Frederick Snare Corp., New York, general contractor.

4000 tons, 32-story office building, 29 Broadway, New York, to Harris Structural Steel Co., New York; Adelson Engineering & Construction Co. builder.

2000 tons, city hall underground pedestrian concourse, Philadelphia, 1500 tons, to American Bridge Co., through Keystone State Construction Co., Philadelphia, general contractor, and 500 tons, to Bethlehem Steel Co., Bethlehem, Pa., through Underpinning & Foundation Co. Inc., Philadelphia.

1860 tons, waterworks pumping plant and filter building, Detroit, to McClintic-Marshall Co.

1800 tons, addition to department store, Meier & Frank Co., Portland, Oreg., to Poole & McGonigle, Portland.

1500 tons, bridge work, Seaboard Air Line, to Mt. Vernon Bridge Co., Mt. Vernon, O.

1500 tons, extensions, Youngstown Sheet & Tube Co., Youngstown, to Fort Pitt Bridge Works, Pittsburgh.

1400 tons, pier, Reading Co., Philadelphia, to Belmont Iron Works, Philadelphia.

1315 tons, viaduct, New York Central railroad, Toledo, O., to McClinticMarshall Co.

1240 tons, addition Connors Creek station, Detroit-Edison Co., Detroit, to Bethlehem Steel Co., Bethlehem, Pa.

1000 tons, underpass, Eastern avenue, Baltimore, to Fort Pitt Bridge Works, Pittsburgh.

1000 tons, power plant, Minnesota Power & Light Co., Duluth, to National Iron Works, Duluth.

1000 tons, church-apartment, Madison avenue and Thirty-first street, New York, to Easton Structural Steel Co., Easton, Pa. Morris H. Rothschild, Church Engineering Corp., general contractor.

1000 tons, highway bridge, Baltimore, to Fort Pitt Bridge Works, Pittsburgh.

1000 tons, building, Northwestern Paper Co., Cloquet, Minn., to Minneapolis-Moline Power Implement Co., Minneapolis.

750 tons, building, Pacific Coast Cast Iron Pipe Co., at Provo, Utah, to Provo Foundry & Machinery Co., Provo.

650 tons, work for Byllesby Engineering & Management Corp. in Oklahoma, to Mississippi Valley Structural Steel Co., St. Louis.

550 tons, 10-story office building, Perth Amboy, N. J., to Hinkle Iron Works, New York; John Lowry Co., general contractor.

500 tons, store and office building, Hirsch Bros., Elizabeth, N. J., to Levering & Garrigues Co., New York, through Turner Construction Co., general contractor; Myers & Shanley, architects.

500 tons, addition to plant of Caterpillar Tractor Co., Minneapolis, to Austin Co., Cleveland.

450 tons, St. Agnes hospital, Philadelphia, to American Steel Engineering Co., Philadelphia.

425 tons, garage, East Eighty-fifth street, New York, to Kues Bros. Iron Works, Bronx, N. Y.

350 tons, state highway bridge, Marathon, Wis., to Wausau Iron Works, Wausau, Wis.

350 tons, Y.W.C.A. building, Schenectady, N. Y., welded construction, to Belmont Iron Works, Philadelphia.

350 tons, Washington avenue elevated track extension, Pennsylvania railroad, Philadelphia, to Belmont Iron Works, Philadelphia.

350 tons, school, Our Lady of Victory, Floral Park, N. Y., to Levering & Garrigues Co., New York.

300 tons, highway bridge, Nyando, N. Y., to American Bridge Co.

250 tons, building, Standard Oil Co., Bayway, N. J., to Joseph T. Ryerson & Son Inc., New York.

200 tons, building, Broadway and 104th street, New York, to George A. Just Co., Brooklyn, N. Y.

200 tons, synagogue, Shaaere Zedek congregation, Chicago boulevard, Detroit, to Palmer-Bee Co., Detroit, through Otto Misch, Detroit, general contractor.

200 tons, bridge work, Baltimore & Ohio railroad, to Mt. Vernon Bridge Co., Mt. Vernon, O.

200 tons, boiler house, Warrensville sanitarium, for Cleveland; to National Iron & Wire Co., Cleveland, through W. J. Schirmer Co., general contractor.

Awards Compared

	Tons
Awards this week	34,413
Awards last week	30,992
Awards two weeks ago	21,285
Awards this week in 1929	70,950
Average weekly awards, 1930	34,392
Average weekly awards, 1929	42,213
Average weekly awards, May	48,522
Total awards to date, 1929	1,086,125
Total awards to date, 1930	859,794

200 tons, factory at Elizabethport, N. J., to Harris Structural Steel Co., New York.
180 tons, store addition, Cherry & Co., New Bedford, Mass., to John E. Cox Co. Inc., Fall River, Mass., through George Howard & Son, general contractors.
180 tons, Lafayette telephone exchange, Southern California Telephone Co., Los Angeles, to Virginia Bridge & Iron Co., Roanoke Va.
177 tons, apartment, Boston, to Lehigh Structural Steel Co., Allentown, Pa.
166 tons, county bridge, Clackamas river, Oregon, to Lindstrom & Feigenson, Portland, Oreg.
150 tons, factory building, Calco Chemical Co., Bound Brook, N. J., to Levering & Garrigues Co., New York.
150 tons, building, Superior Earth Co., Ocala, Fla., to Ingalls Iron Works Co., Birmingham, Ala.
150 tons, bridge, Reading Co., Ashland, Pa., to Bethlehem Steel Co., Bethlehem, Pa.
150 tons, Villanova college building, Villanova, Pa., to Belmont Iron Works, Philadelphia.
110 tons, building, Harshaw Chemical Co., Cleveland, to Niles Forge & Mfg. Co., Niles, O. through Mark Swisher, Cleveland, general contractor.
110 tons, county bridge, Alloway, N. J., to Bethlehem Steel Co., Bethlehem, Pa.
100 tons, Newell street bridge, Pittsfield, Mass., to Haarman Steel Co., Holyoke, Mass.
100 tons, plant addition, Simonds Saw & Steel Co., Lockport, N. Y., to McManus Steel Co., Buffalo, through Morris & Allan, Buffalo, general contractors.
100 tons, foundry extension, Goslin-Birmingham Mfg. Co., Birmingham, Ala., to Ingalls Iron Works Co., Birmingham.
100 tons, factory, Pomona Pump Co., Pomona, Calif., to Consolidated Steel Corp., Los Angeles.
100 tons, store, Best & Co., Orange, N. J., to Breen Iron Works, Newark, N. J., through Turner Construction Co., general contractor.

CONTRACTS PENDING

15,000 tons, terminal, Pennsylvania railroad, West Philadelphia; general contract to United Engineers & Constructors Inc., Philadelphia. Plans for steel expected out next week.
4400 tons, plant, Ford Motor Co., Richmond, Calif.; bids June 23.
4000 tons, building, Girard Trust Co., Philadelphia; general contract to United Engineers & Constructors Inc., Philadelphia.
1700 tons, highway bridge over Missouri river, in Nebraska.
1500 tons, Travel and Transportation building, Chicago World's Fair, Grant park, Chicago; bids June 20.
1500 tons, bridge, Coplay, Pa.; bids rejected, new bids to be taken.
1400 tons, office building, Beaver street, New York.
1000 tons, bridge work, Chicago, Burlington & Quincy railroad.
1000 tons, county bridge, Tyngsboro, Mass.
800 tons, grade crossing elimination, Kentucky & Indiana Terminal Railroad Co., Louisville, Ky.
750 tons, highway bridge, Chandlerville, Ill.
500 tons, Brown building, Waterbury, Conn.
500 tons, highway bridges, New York, in addition to 500 tons pending last week.
500 tons, warehouse, LaCrosse, Wis.
500 tons, high school, Lyndhurst, Long Island, N. Y.
450 tons, dormitory, Drexel institute, Philadelphia; general contract to Day & Zimmerman Engineering & Construction Co., Philadelphia.
450 tons, war memorial building, Trenton, N. J., new bids requested.
362 tons, three dams on Guadalupe river below Sequin, Tex., for Texas Hydro-Electric Corp.; general contract to Sumner Sollitt Co., San Antonio, Tex.
330 tons, McClary bridge in Marathon county, Wis., general contract to Chermus Construction Co., Minneapolis, at $59,790.20; W. J. Maselton division state highway engineer, Wausau, Wis.
275 tons, mill board building, Philadelphia; general contract to Day & Zimmerman Engineering & Construction Co., Philadelphia.
200 tons, school, Frontenac and Summerdale streets, Philadelphia.
200 tons, 6-story bank addition, Crawford County Trust Co., Meadville, Pa.; work to start June 25.

Concrete Bars

Heavy Awards Fairly Numerous—California Is Busy Section—Prices Steadier

JUNE tonnage promises to approximate the heavy total for May. Awards and inquiries are seasonally frequent. A 1700-ton pier was placed at New York; also a 740-ton pier in California, where seven other awards totaled 1800 tons and where eight inquiries aggregate 4848 tons, topped by Ford Motor Co. plant at Richmond, Calif. Specifications seem to be improving somewhat.

REINFORCING BAR PRICES, PAGE 87

New York, June 17.—Concrete reinforcing bar prices appear to be dragging bottom. While no higher, prices appear steadier on medium sized tonnages. Lettings are running slightly ahead of last year, but weak prices tend to keep down profits. Pier No. 34, New York, will take 1700 tons, going to Faitoute Iron & Steel Co.

Boston, June 17.—Business in concrete bars continues to consist largely of a few small tonnages. Only about 175 tons was sold by various interests last week. Prices hold on small lots.

Buffalo, June 17.—Demand for reinforcing bars has improved somewhat. A Buffalo producer took 240 tons for a public school, while several small lots also were booked. Third quarter outlook is fairly good.

Pittsburgh, June 17.—Incoming concrete bar tonnage to mills is approximating the heavy May volume and the near future outlook is favorable. Producers report a steadier price tone with tonnages going less frequently at lower figures of the current market of 2.00c to 2.05c for cut lengths and 1.75c to 1.80c for stock. Few large tonnages are included in pending work, while awards also are small. A petition is before the Pittsburgh council to prohibit use of rail-steel bars on local work.

Cleveland, June 17.—Outside of 1000 tons for Central-Lorain bridge piers, concrete bar inquiries are small. Lettings recently have been confined to 100 tons or less. Bids close June 20 on the board of education's headquarters building, which, while it is a structural steel job, will take 100 tons or more of concrete bars. Billet bars usually are 1.70c to 1.75c, Cleveland, but $1 to $2 a ton less has been done.

Chicago, June 17.—Award of 1500 tons of concrete bars for Illinois state road work was made to several fabricators. Widely scattered small tonnage work adds interest to the market. Most billet bar fabricators now quote 1.85c for orders of 500 tons and over, 2.00c for 30 to 500-ton lots, and 2.45c for orders under 30 tons.

Awards Compared

	Tons
Awards this week	10,525
Awards last week	8,965
Awards two weeks ago	3,698
Awardsthis week in 1929	4,646
Average weekly awards, 1929	5,849
Average weekly awards, 1930	7,181
Average weekly awards, May	8,227
Total awards to date, 1929	160,853
Total awards to date, 1930	179,519

CONTRACTS PLACED

1700 tons, pier 34, department of docks, New York, foot of Spring street, to Faitoute Iron Steel Co., Newark, N. J., through Allen N. Spooner & Sons, general contractors.
1500 tons, Illinois state road work, to several fabricators and jobbers.
800 tons, concrete retaining wall, Gulf Refining Co., Staten Island, N. Y., to McClintic-Marshall Co.
740 tons, pier shed No. 15, San Francisco, to Soule Steel Co., San Francisco.
700 tons, mesh, government work, Mississippi river, to National Steel Fabric Co., Pittsburgh.
600 tons, elevator, Walston Purina Co., St. Louis, to Laclede Steel Co., St. Louis.
550 tons, postoffice, Baltimore, to Joseph T. Ryerson & Son Inc.
480 tons, warehouse, General Electric Co., Cleveland, to Paterson-Leitch Co., Cleveland.
450 tons, court house, Brooklyn, N. Y., to Igoe Bros., Newark, N. J.
444 tons, school, Ostego avenue, San Francisco, to W. S. Wetenhall Co., San Francisco.
400 tons, bridge piers and approaches over Hackensack river, near Marion, N. J., Pennsylvania railroad, to Concrete Steel Co., through Frederick Snare Corp., general contractor.
329 tons, hospital, Palo Alto, Calif., to Pacific Coast Steel Corp., San Francisco.
275 tons, apartment Serrano and San Marino streets, Los Angeles, to unstated interest.
275 tons, school, Frontenac and Summerdale streets, Philadelphia, to Penn Steel Service Co., Philadelphia.
240 tons, public school, Buffalo, to a Buffalo district fabricator.
230 tons, hotel, Santa Clara street, San Jose, Calif. to Soule Steel Co., San Francisco.
222 tons, school. Second street, San Jose, Calif., to W. S. Wetenhall Co., San Francisco.
160 tons, road work, route 30, section 9, New Jersey, to Joseph T. Ryerson & Son. Co. Inc.
150 tons, women's gymnasium, Leland Stanford University, Palo Alto, Calif., to Concrete Engineering Co., San Francisco.
150 tons, bridge over Salinas river at Gonzales, Calif., to Pacific Coast Steel Corp., San Francisco.
130 tons, opera studio and storage building, Chicago, to unstated fabricator.

CONTRACTS PENDING

2500 tons, plant, Ford Motor Co., Richmond, Calif., bids June 23.
750 tons, store, Hale Bros., San Jose, Calif., bids June 16.
623 tons, three dams on Guadalupe river below Seguin, Tex., for Texas Hydro-Electric Corp.; general contract to Sumner Sollitt Co., San

Antonio, Tex.
438 tons, paving in San Mateo county, Calif.; bids July 2.
420 tons, Sixth street viaduct, Los Angeles; bids received.
350 tons, George Westinghouse bridge approaches, Pittsburgh; general contract to M. H. Parish Inc., Pittsburgh.
300 tons, post office addition, Brooklyn, N. Y.
224 tons, printers building, San Francisco; bids being taken.
200 tons, Hall of Justice, Pasadena, Calif.; bids being taken.
182 tons, bridge over Shasta river, Siskiyou county, Calif.; bids July 2.
134 tons, bridge over Klamath river, Siskiyou county, Calif.; bids July 2.
100 tons, Mitten building, Philadelphia.
100 tons, tunnel, East river, New York subway system; general contract to Mason & Hanger, New York.

Pig Iron

(*Concluded from Page* 89)

iron are $18 to $18.50, base. It is reported iron from Chicago district docks was sold north of here as low as $16.75, Chicago, but as silicon differentials of either 25 cents or 50 cents apparently were a consideration in the delivered price the net return to the seller is not clear. Fewer low price offers on dock iron now are encountered. No later sales were below $18, base, Chicago. About 500 tons of southern iron was sold in this market in the past week. A central Illinois implement maker is inquiring for 1500 to 2000 tons of malleable. A fair tonnage of 12 to 13 per cent silvery iron is on inquiry for which a price of $24, furnace, has been named, a concession of $1.50 or more on the schedule as revised downward a week ago.

Philadelphia, June 17.—Activity in the pig iron market is restricted to small scattered sales. Inquiries are scarce, only one of substantial size being figured in this district. Prices are steady.

St. Louis, June 17.—Melters have all the pig iron they will need for the remainder of this quarter and some will enter the next quarter with tonnage they had expected to use some time ago. Shipments have declined slightly, some buyers having requested furnaces to delay deliveries. Furnace stocks have increased. Inquiry for third quarter is insignificant. Tonnage engaged for that period is the smallest for this time in more than five years. Quotations are unchanged but competition is keener and the trend generally is easier.

Birmingham, Ala., June 17.—New business in pig iron is limited to small lots, a few sales being noted for delivery to Atlantic coast points. One blast furnace at Ensley, Ala., has been blown out and another has been banked. Both were making basic iron.

Toronto, Ont., June 17.—Books have been opened for third quarter and melters show more interest. Individual tonnages are smaller than those booked for first or second quarter, due chiefly to the fact consumers will have considerable iron due them on second quarter contracts. The spot market is quiet. Furnaces are booking third quarter contracts at current prices.

Rails, Cars

Car Orders Expected Within Two Weeks—50,000 Tons Rails Reported Placed—Few Engines Up

PURCHASE of 3200 railroad cars, on inquiry for some time, probably will follow the Atlantic City, N. J., railroad exhibition. This may defer time for closing car shops beyond the date now tentatively set, July 15. Rail buying is small and intermittent, although Santa Fe is reported as closing on 50,000 tons in Colorado. Pittsburgh & Lake Erie wants last half year axles and tubes.

RAILROAD TRACK PRICES, PAGE 88

Chicago, June 17.—Rail mills in this district booked less than 1000 tons of standard section rails last week, but a Colorado mill is reported to have received 50,000 tons for a Santa Fe extension in the Southwest. Rail mill operations here are a little lower at 65 to 70 per cent. Track fastenings sales amounted to about 1500 tons.

Car building shops are winding up Chesapeake & Ohio orders. This work will extend operations of some car builders into July, but it is expected that by the middle of July car shops, with few exceptions, will be down almost entirely. General American Tank Car Corp. is working on 500 to 600 refrigerator cars for a subsidiary, and 500 stock cars for the Milwaukee road. In addition, this company is building tank cars for leasing and for private interests, and thus expects to have fair operations throughout the summer.

New York, June 17.—Car sellers do not look for additional car buying until after the close of the railroad exhibition next week at Atlantic City, N. J. Of 3200 freight cars actively pending, 2200 or more for Illinois Central undoubtedly will pend until that time. In other cases delay also is indicated. Fresh inquiry is light. Chicago & North Western has revised specifications on ten flat cars.

Philadelphia, June 17.—Norfolk & Western has opened bids on 18,000 kegs of track spikes. Atlantic Coast Line is inquiring for 5000 kegs.

Pittsburgh, June 17.—The market for rails and track material continues dull. Specifications, while quiet, are in fair seasonal volume. New inquiry is light. Pittsburgh & Lake Erie will take bids until June 27 for its second-half requirements of car axles and tubes.

Birmingham, Ala., June 17.—Shutdown of the Ensley, Ala., rail mill is believed to extend for about seven weeks. By Aug. 1 orders probably will have been booked to warrant resumption of operations. In the meantime repairs and improvements will be undertaken. Pullman Car & Mfg. Corp. is working up its last car order.

CAR ORDERS PLACED

Duquesne Slag Products Co., one air dump car, to Koppel Industrial Car & Equipment Co., Koppel, Pa.
Union Pacific, 20 ore cars, to St. Louis Car Co., St. Louis.
Waugh Bros. Inc., Nicholasville, Ky., 10 air dump cars, to Koppel Industrial Car & Equipment Co., Koppel, Pa.
Westinghouse Electric & Mfg. Co., 60 air dump cars, to Koppel Industrial Car & Equipment Co., Koppel, Pa.

LOCOMOTIVE ORDERS PLACED

Canadian National, two locomotives, to Montreal Locomotive Works.

RAIL ORDERS PLACED

50,000 tons, rails, Santa Fe extension in the Southwest, reported placed with a Colorado mill.

CAR ORDERS PENDING

Boston & Maine, nine coaches and four combination baggage and smoking cars.
Chicago & North Western, 10 flats; noted May 1; specifications revised.
Freeport Sulphur Co., 10 50-ton steel hopper bottom gondola cars.
Republic Steel Corp., 15 to 18 70-ton gondola car bodies.

LOCOMOTIVE ORDERS PENDING

Illinois Central, five oil-electric locomotives.

Tractors, Trucks Gain

Washington, June 17.—Shipments of electric industrial trucks and tractors rose in May to 144 units, the largest monthly total since October, 1929. Both domestic and export shipments contributed to the increase, as reported by ten leading manufacturers to the department of commerce. May's total, however, is considerably under the mark of 211 units for May of 1929, according to the following comparisons:

1929	Total	Shipments—Domestic	Shipments—Export
May	211	202	9
Total (5 mos.)	902	848	54
June	201	185	16
July	168	163	5
August	154	144	10
September	158	151	7
October	167	134	33
November	118	110	8
December	151	124	27
Total (year)	2,019	1,859	160
1930			
January	140	123	16
February	113	106	7
March	123	109	14
April*	106	101	5
May	144	125	19
Total (5 mos.)	626	564	62

*Revised.

Wire

Dealer Buying Lessens, Leaving Market Without Support—Third Quarter Prices Steady

SUPPORT from buying by dealers has failed the wire and nail market, and demand for manufacturers' wire also is light. Books for third quarter have been opened with prices at current levels, and some contracts have been placed. Buyers in general show little interest in future requirements. Nails are in slow demand and prices are shaded in some cases.

WIRE PRICES, PAGE 88

Chicago, June 17.—Dealer buying of wire products, which has helped sustain the market in recent weeks, has dropped off sharply. Demand for manufacturers' wire remains light. Buyers show little interest in third quarter, although mills are ready to take tonnage. The view is that prices represent the bottom of the market. Plain wire is 2.35c, Chicago or western mills, while annealed fence wire remains 2.35c to 2.45c. Concessions are offered for fair sized orders.

Worcester, Mass, June 17.—Third quarter specifications forecast no change in quotations and little advance in production schedules. Demand has slacked since the first of the month. Plain bright wire to dealers is firm at 2.40c, base, Worcester.

New York, June 17.—Sellers of wire products have reaffirmed current official quotations for third quarter. Nails, however, are easy at $2.15, Pittsburgh, with occasional shading of 5 cents. Nail demand is at a virtual standstill. Little activity is noted in plain wire, but the situation is firmer than in nails, with the market 2.30c, Pittsbugh.

Pittsburgh, June 17.—Demand for wire products is holding its own and with a steady tone reported in prices the outlook is fairly favorable. Specifications for merchant material continue to moderate slowly in keeping with the general industrial trend. Third quarter books have been opened at unchanged prices and although contracting is not brisk it is normal. Prices are unchanged at $2.15 and $2.25 for standard wire nails and 2.30c for bright plain wire.

Cleveland, June 17.—An occasional carload of plain wire or a mixed carload of wire products for jobber's stocks constitute market activity. Nail orders are the lowest of the year. One order for 600 kegs of cement coated nails went at $2 a ton less than $4.089, the figure using $2.15, Cleveland, for base. Plain wire is 2.30c, Cleveland.

Cold Finished Steel

Price Holds for Third Quarter Despite Declining Demand

COLD FINISHED PRICES, PAGE 88

Cleveland, June 17.—Interest in third quarter contracting is negligible. Producers are unable to stir up any interest. Prompt buying is limited, only a few small orders being placed for immediate wants. The 2.10c, Cleveland, quotation is generally maintained.

Pittsburgh, June 17.—Cold-finished bar demand has declined further, sustained to a certain extent, however, by fair business from consumers other than automotive interests. Further decline in requirements of the latter group is in prospect for July. Producers have opened books for third quarter at unchanged prices of 2.10c for cold-finished bars and 2.45c to 2.90c for turned and ground shafting.

Engineers Open Meeting

Buffalo, June 17.—With a registration of more than 1500, the Association of Iron and Steel Electrical Engineers opened its annual convetion here yesterday at Hotel Statler. In connection with the convention an exposition of steel plant electrical equipment and accessories is being conducted in the Broadway auditorium. A brief business session opened the meeting on Monday morning, but during the balance of the week sessions will be devoted to discussions of technical subjects.

Newton Rolls Stainless

Youngstown, O., June 17.—Newton Co. now is producing and shipping Krupp nirosta sheets known as KA2, or 18-8. The Newton company is not producing this grade of steel but is rolling it into sheets, now being in production at its Newton Falls, O., mills. Its registered trademark is "Newaloy." These nirosta sheets are being produced in standard sheet sizes in such gages as are produced by sheet mills.

Besides these stainless steel sheets, the Newton company also is rolling electrical and enameling sheets at its Newton Falls works, where it also continues to roll some autobody sheets for eastern shipment.

Strip

Specifications Shrink Steadily—Automotive Users Take Less—Buying in Small Lots

WITHDRAWAL of much of the demand for strip by automotive users has taken support from the market and present bookings are much below recent weeks, with further decline expected at midsummer. Prices are fairly firm, with some concessions for attractive business. Third quarter contracts are being offered at prices which have prevailed for second quarter.

STRIP PRICES, PAGE 88

Pittsburgh, June 17.—Decline in demand for strip steel from automotive users has become more rapid. Requirements of Ford and Chevrolet are fairly well maintained but a substantial reduction in tonnage for these two interests, particularly for the former, is in view for July. Specifications from other automotive buyers continue light. Mill operations are lower at 60 to 65 per cent for hot strip production with cold-rolled mills at 25 to 30 per cent. Producers are taking third quarter contracts with prices unchanged at 1.70c and 1.80c for hot strip and 2.45c to 2.55c for cold strip. Occasional concessions continue to be noted on hot strip, although 1.70c and 1.80c generally represent the market.

Cleveland, June 17.—Strip steel specifications continue to shrink. Automotive use is further curtailed. Practically the only consumers are found in Ohio-Michigan territory among parts makers for Ford and Chevrolet. These, however, are taking less than two or three weeks ago and indicate their acceptance will be further reduced soon. Prices accordingly are weak. While an effort is being made to maintain 1.70c and 1.80c, base, Pittsburgh, on hot strip, concessions of at least $1 a ton are made for wide and narrow. Cold strip shipments are light. Buying is restricted to small lots. The 2.45c, Cleveland, price is more common, although some still endeavor to get 2.55c on small lots.

New York, June 17.—Cold-rolled strip is easy at 2.45c to 2.55c, Pittsburgh, and hot-rolled at 1.70c to 1.80c, Pittsburgh, for wide and 1.80c to 1.90c for narrow.

Philadelphia, June 17.—Cold-rolled strip continues at 2.45c to 2.55c, Pittsburgh, and hot strip at 1.70c for 6 to 24-inch and 1.80c for narrow. Occasional shading is done on desirable lots.

Nonferrous Metals

Trend of Market in General Is Uncertain as New Low Price-Level Are Reached by Copper, Tin, and Zinc—Lead Is Steady

Prices of the Week, Cents a Pound

	Copper—Electro delivered	Copper—Lake delivered	Copper—Casting refinery	Straits Tin—New York Spot	Straits Tin—New York Futures	Lead New York	Lead East St. Louis	Zinc St. Louis	98-99% Aluminum	Spot Antimony	Ingot Nickel
June 11	12.75	13.10	12.37½	29.92½	30.40	5.50	5.40	4.57½	23.90	7.10	35.00
June 12	12.62½	13.10	12.25	29.75	30.15	5.50	5.40	4.50	23.90	7.10	35.00
June 13	12.00	.....	11.75	29.55	29.95	5.50	5.40	4.50	23.90	7.10	35.00
June 14	12.00	.....	11.75	29.50	29.90	5.50	5.40	4.50	23.90	7.10	35.00
June 16	12.00	12.12½	11.75	29.60	30.05	5.50	5.40	4.50	23.90	7.10	35.00
June 17	11.75	12.10	11.62½	29.50	29.90	5.50	5.40	4.47½	23.90	7.10	35.00

NEW YORK, June 17.—The metal market has been unsettled in the past week, with new low prices recorded for copper, zinc and tin. Buying of copper picked up a little when the market reached 12.00c, Connecticut, but other metal sales have been inactive.

New business in brass and copper products is almost at a standstill. Specifications against contracts are moderately active. Prices are being readjusted in accord with the lower prices of copper and zinc.

Copper—Custom smelters have marked down their prices in rapid steps from 13.00c to 11.75c, Connecticut. Other producers stood aside for awhile, and let custom smelters take all the business. This is a method often used in the copper market to give support to the weaker factors in the situation, but on this occasion the custom smelters found new business difficult to attract, due to the well booked position of consumers since the buying wave of a month ago. At the 12-cent level, large producers returned to the market, especially to take care of regular customers, so that practically all support disappeared. For many months, artificial support to greater or less degree has been an important factor in the price situation. Whether or not the market has yet reached the level where the low price will make for stability is uncertain. Most producers are not pushing the market, but the custom smelter situation is uncertain.

Zinc—Prices have been cut as producers sought orders for themselves, or at least have been open to bids by consumers. Surplus stocks weigh heavily on the market, and there does not appear to be much buying power at present to take them up. Opinions vary on whether the market will go still lower. The ore market is unchanged at $31 a ton. The differential on the high grade zinc remains steady at 1 cent a pound.

Tin—Due to the continued absence of consumers, the market has been forced to lower levels. But the fluctuations have been narrow between 29.00c and 30.00c a pound. Stocks continue to accumulate here and in England, as there are no reports yet of any important curtailment. Prices are so extremely low, and buying has been small for so long, that some reaction is possible at an early date, though not yet definitely indicated.

Lead—New business has been light, but producers have been firm.

Mill Products

Base price cents per pound f.o.b. mill, except where otherwise specified

Copper and brass product prices are based on 12.50c, delivered Connecticut, for copper

SHEETS	
Yellow brass (high)	19.00
Copper, hot rolled	22.25
Red brass (low) 80% cu.	20.37½
Best spring, drawing, spinning brass	21.75
Nickel silver, grade A, 18%	30.25
Lead, full sheets (cut ½c more)	9.25
Zinc sheet (100-pound base)	10.00
TUBES AND PIPES	
Seamless yellow brass (high)	24.00
Seamless copper	24.50
Seamless com. bronze, 90%	25.87½
Plumbing, I. P. sizes, yellow	23.00
Brazed brass, 75% cu.	26.50
RODS	
Yellow brass (high, full turnings)	17.25
Naval brass	20.12½
Com. bronze 90%	21.87½
SHAPES	
Brass angles and channels	27.00
Com. bronze angles, channels	39.12½
ANODES	
Copper, in ovals	18.75
WIRE	
Yellow brass (high)	19.50

Old Metals

Dealers' buying prices, cents per pound

HEAVY RED BRASS	
New York	7.25 to 7.50
Chicago	7.50 to 8.00
Cleveland	7.25 to 7.50
St. Louis	7.50 to 8.00
HEAVY YELLOW BRASS	
Cleveland	4.50 to 4.75
HEAVY COPPER AND WIRE	
New York	8.50 to 9.00
Boston	8.50 to 9.00
Chicago	9.25 to 9.75
Cleveland	8.00 to 8.50
St. Louis	8.00 to 8.50
RED BRASS BORINGS	
New York	6.75 to 7.25
YELLOW BRASS TUBING	
Cleveland	4.50 to 4.75
LIGHT COPPER	
New York	7.00 to 7.50
Chicago	7.50 to 8.00
Cleveland	7.00 to 7.50
St. Louis	7.50 to 7.75
LIGHT BRASS	
Boston	4.00 to 4.50
Chicago	4.25 to 4.75
Cleveland	3.00 to 3.25
St. Louis	4.25 to 4.50
ZINC	
New York	2.00 to 2.50
Cleveland	2.00 to 2.25
St. Louis	2.00
ALUMINUM	
Clippings, soft, Cleveland	11.00 to 12.00
Clippings, hard, Cleveland	9.00 to 10.00
Borings, Cleveland	5.50 to 6.00
Cast, Cleveland	7 75 to 8.00
Cast, Boston	8.00 to 8.50
Cast, St. Louis	7.50

Secondary Metals

Remelt aluminum No. 12	15.50
Brass ingot, 85-5-5-5	11.25 to 11.50

Coke By-Products

Shipments Against Contracts Dominate—Naphthalene the Most Active

New York, June 17.—Demand for light oil distillates is largely against contracts. Some spot business is noted for benzol and toluol. The slight flurry which followed the recent reduction in the price of the latter appears to have subsided. Phenol buying is spotty. Consumers are taking material in a conservative way. Prices are unchanged. Consumers as a rule appear to be well supplied with material. Naphthalene is the most active in the list. Shipments against contracts continue heavy and some spot business is noted. With several distributors, naphthalene volume compares favorably with last year.

Coke By-Products

Per Gallon at Producers' Plants in Tank Lots

	Spot
Pure benzol	$0.21
90 per cent benzol	0.21
Toluol	0.30
Solvent naphtha	0.28
Commercial xylol	0.28

Per Pound at Producers' Plants in 250-Pound Drums

Phenol	0.16 to 0.17

Per Pound at Producers' Plants

Naphthalene flakes	0.04½ to 0.05½
Naphthalene balls	0.05½ to 0.06½

Per 100 Pounds Delivered

Sulphate of ammonia	$2.10 to $2.20

Barrels Show Decline

Cleveland, June 17.—A total of 511,866 steel barrels was shipped in April when production stood at 46.2 per cent of capacity, according to reports received from members of the Steel Barrel institute, Cleveland. A slight drop is to be noted in comparison with April's production at 47.5 per cent of capacity and shipments of 518,758 units.

Quicksilver Unchanged

New York, June 17.—Quicksilver is quiet and unchanged at $120 to $121 a flask.

Warehouse

June Holding May's Levels—Recent Price Cuts Fail to Boost Demand—Prices Ease, Cuts Announced at Philadelphia

BUSINESS still drags and price cuts have given little impetus to purchasers whose orders show little change from May. Sheet prices are easier at New York and Pittsburgh and most products are cut $2 a ton or more at Philadelphia. There is some optimism in the southwest, although current opinion averages pessimistic and little hope is entertained for a summer pickup.

Boston—Warehouse interests in the district are finding just a fair amount of materials moving. Prices are held on small lots. Collections continue satisfactory.

New York—The slightly improved rate in warehouse buying is being maintained, although the situation is far from brisk. Prices are unchanged, although in sheets and one or two other items, the minimum figures in the respective price spreads are more representative of the market.

Philadelphia—Warehouses have reduced prices on most products $2 a ton or more to conform to recent mill reductions. Light blue annealed sheets are quoted 3.30c from warehouse.

Buffalo—Warehouse demand for iron and steel is about equal to that of last month, although some lines show considerable improvement, notably in pipe and building material. The quarter will run materially behind last year.

Cincinnati—Demand at local warehouses is showng little change from May, with small orders predominating. Movement of cold-rolled products has not been changed by recent price cuts.

Chicago—Warehouse sales are not far behind May, but non important gains are made. Prices for wire products are showing some irregularity.

St. Louis—Except on commodities for road construction, river and levee, and other outdoor work, demand for iron and steel from warehouse remains quiet. One leading interest reports a better inquiry for sheets, but generally that material is slow. Plates, shapes, bars and channels are moving in smaller than seasonal volume. Recent improvement in the crop outlook and building projects is expected to better demand.

Cleveland—The quiet situation in the warehouse market continues unchanged. Prices are maintaining a fair degree of firmness. Orders continue for small lots only.

Pittsburgh—Business is holding its own, with heavier demand reported by a few distributors. Demand still is seasonally light.

Warehouse Quotations in Cents Per Pound at Leading Market Centers

Hot Mill Products Subject to New Quantity Differentials Adopted March 3, 400 to 3999 Pounds Being Base

STEEL BARS

Baltimore	3.00c
Boston	3.265c
Buffalo	3.30c
Chattanooga	3.25c
Chicago	3.00c
Cincinnati	3.30c
Cleveland	3.00c
Detroit	3.00c
Houston	3.00c
Los Angeles	3.30c
New York††	3.25c
Philadelphia	2.70c
Pittsburgh	2.90c
Portland	3.00c
San Francisco	3.40c
Seattle	3.15c
St. Louis	3.15c
St. Paul	3.25c
Tulsa	3.65c

IRON BARS

Baltimore	3.25c
Boston	3.265c
Buffalo	3.30c
Chattanooga	3.25c
Chicago	3.00c
Cincinnati	3.30c
Detroit	3.00c
New York††	3.25c
Philadelphia	2.70c
St. Louis	3.15c
Tulsa	3.65c

REINFORCING BARS

Baltimore	2.50c to 3.31c
Boston	2.665c
Buffalo	2.95c
Chattanooga	3.25c
Cincinnati	3.30c
Cleveland	2.25c to 2.44c
Detroit	2.30c to 3.00c
Houston	3.00c
Los Angeles cl.	2.40c
Los Angeles lcl.	2.70c
New York	2.65c to 3.10c
Philadelphia	2.50c to 3.00c
Pittsburgh	2.75c
San Francisco cl.	2.30c
San Francisco lcl.	2.60c
Seattle	3.00c
St. Louis	3.15c
Tulsa	3.65c
Youngstown	2.30c to 2.60c

STRUCTURAL SHAPES

Baltimore	3.00c
Boston	3.365c
Buffalo	3.40c
Chattanooga	3.35c
Chicago	3.10c
Cincinnati	3.40c
Cleveland	3.40c
Detroit	3.10c
Houston	3.25c
Los Angeles	3.30c
New York	3.30c
Philadelphia	2.60c
Pittsburgh	3.00c
Portland	3.00c
San Francisco	3.40c
Seattle	3.15c
St. Louis	3.25c
St. Paul	3.35c
Tulsa	3.75c

PLATES

Baltimore	3.00c
Boston	3.365c
Buffalo	3.40c
Chattanooga	3.35c
Chicago	3.10c
Cincinnati	3.40c
Cleveland ¼ in. and thicker	3.00c
Cleve., 3/16-in.	3.20c
Detroit	3.10c
Detroit, 3/16-in.	3.10c
Houston	3.00c
Los Angeles	3.30c
New York	3.30c
Philadelphia	2.60c
Pittsburgh	3.00c
Portland	3.00c
San Francisco	3.40c
Seattle	3.15c
St. Louis	3.25c
St. Paul	3.35c
Tulsa	3.75c

NO. 10 BLUE ANNEALED

Baltimore	3.50c
Boston 3/16-in.	3.915c
Buffalo	3.50c
Chattanooga	3.75c
Chicago	3.35c
Cincinnati	3.45c
Cleveland	3.25c
Detroit	3.35c
Houston	3.90c
Los Angeles	3.85c
New York	3.40c to 3.50c
Portland	3.75c
Philadelphia*†	3.15c
Pittsburgh**	3.25c
San Francisco	3.90c
Seattle	4.00c
St. Louis	3.45c
St. Paul	3.54½c
Tulsa	3.95c

NO. 24 BLACK SHEETS

Baltimore*†	3.75c
Boston	4.85c
Buffalo	4.20c
Chicago	4.05c
Cincinnati	4.05c
Cleveland***	3.75c
Detroit	3.95c
Los Angeles	4.75c
New York	3.60c to 3.65c
Philadelphia*†	3.70c
Pittsburgh**	3.65c
Portland	4.90c
San Francisco	4.90c
Seattle	5.00c
St. Louis	4.25c
St. Paul	3.79c
Tulsa	4.45c

NO. 24 GALVANIZED SHEETS

Baltimore*†	4.50c
Boston	5.60c
Buffalo	4.40c to 4.60c
Chicago (local delivery)	4.60c
Chicago (outside shipment)	4.35c to 4.60c
Cincinnati	4.90c
Cleveland***	4.50c
Detroit	4.60c
Houston	5.40c
Los Angeles	5.20c
Pittsburgh**	4.30c
New York	4.25c to 4.50c
Philadelphia*†	4.25c
Pittsburgh**	4.30c
Portland	5.50c
San Francisco	5.30c
Seattle	5.50c
St. Louis	4.85c
St. Paul	4.58c
Tulsa	5.35c

BANDS

Baltimore	3.50c
Boston	4.015c to 5.00c
Buffalo	3.65c
Chattanooga	3.45c
Chicago	3.20c
Cincinnati	3.50c
Cleveland	3.25c to 3.65c
Detroit 3/16-in. and lighter	3.30c
Houston	3.65c
Los Angeles	4.30c
New York	3.75c
Philadelphia	3.00c
Pittsburgh	3.25c
Portland	4.00c
San Francisco	3.75c
Seattle	4.00c
St. Paul	3.50c
Tulsa	3.85c

HOOPS

Baltimore	3.50c
Boston	5.50c to 6.00c
Buffalo	4.05c
Chicago	3.75c
Cincinnati	4.05c
Cleveland	3.25c to 3.65c
Detroit, No. 14 and lighter	3.80c
New York	4.25c
Philadelphia	3.25c
Pittsburgh	4.25c
Seattle	5.00c
St. Paul	4.00c

COLD FINISHED STEEL

	Rounds, hexagons	Flats squares
Baltimore (c)	3.30c	(a) 3.80c
Boston	3.55c	4.05c
Buffalo	3.95c	4.45c
Chattanooga*	3.85c	4.35c(d)
Chicago	3.35c	3.85c
Cincinnati	3.80c	4.30c
Cleveland	3.40c	3.90c
Detroit	3.65c	4.15c
Los Angeles (a)	4.50c	.....
New York	3.50c	4.00c
Philadelphia*	3.40c	3.90c
Pittsburgh	3.35c	3.85c
Portland (a)	4.50c	.....
San Fran. (a)	4.25c	.....
Seattle (a)	4.75c	.....
St. Paul (a)	3.85c	.....
Tulsa	4.75c	5.14c

(a) Rounds only. (d) Squares only. *Plus quantity differentials.

COLD ROLLED STRIP

Boston, 0.100-inch 500 pounds lots	5.30c
Buffalo	5.85c
Chicago (soft) (b)	6.15c
Cincinnati	6.10c
Cleveland (b)	5.95c
Detroit	3.65c 4.15c
New York	5.05c
Philadelphia (c)	5.05c

(b) Net base, straightening, cutting, boxing 1 ton or more. (c) Plus mill, size and quantity extras.

SWEDISH IRON AND STEEL

New York duty paid

Hollow drill steel	12.50c
Iron bars, round	6.25c
Iron bars, flats and squares	6.50c

††Domestic bars. **Less than 25 sheets. *†50 or more bundles.
***Less 0.15c where more than 10 bundles are ordered at once for delivery at one time.

Pacific Coast

Better Volume of Steel Buying—Inquiries Are in Greater Number

CALIFORNIA and the northwest coast states feel an increase in demand for steel, both in actual sales and in prospective business. Sales are larger and new projects are coming out in large numbers. Total sales to date are much below those of last year for corresponding months. Prices are fairly steady and small-lot buying is the rule. Foundry situation is unchanged.

San Francisco, June 14.—(*By Air Mail*)—Featuring the market this week were numerous awards of reinforcing steel bars and the call for bids for a number of important structural steel and concrete bar projects. Fabricators and reinforcing steel bar jobbers in San Francisco district report a decided increase in the number of inquiries. Prices are being well maintained.

Pig Iron and Coke

No change in the foundry situation is noted, most plants of the jobbing variety continuing to operate on limited schedules. Movement of both foundry iron and coke is limited to unimportant lots.

Coast Pig Iron Prices

Utah basic	$25.00 to 26.00
Utah foundry	25.00 to 26.00
*German	24.25
*Indian	25.00 to 26.00

*C.i.f. duty paid.

Bars, Plates and Shapes

Concrete bar awards aggregated 2990 tons, the largest weekly total so far this year, and brought the total to date to 24,033 tons, compared with 36,206 tons for the corresponding period last year. The Soule Steel Co. booked 740 tons for Pier Shed No. 15, San Francisco. W. S. Wetenhall Co. took 444 tons for a school in San Francisco and 222 tons for a school in San Jose. The Pacific Coast Steel Corp. secured 329 tons for a hospital in Palo Alto, Calif. Bids open June 23 on 2500 tons for the Ford plant at Richmond, Calif., and June 16 for 750 tons for Hale Bros. store at San Jose. Bids have been opened on 420 tons for the Sixth street viaduct, Los Angeles. Prices remain unchanged on out-of-stock material in the San Francisco district at 2.30c, base, on carload lots, Los Angeles quotations being $2 a ton higher. Merchant bar steel is firm at 2.35c, c.i.f.

Demand for plates, with one or two exceptions, is confined to lots of less than 100 tons. Bids were opened this week on 2027 tons for the Fairman Coulee and Bully Creek siphons at Vale, Oreg. Prices continue unchanged at 2.25c, c.i.f.

Included among structural lettings was 180 tons for a telephone building in Los Angeles, booked by the Virginia Bridge & Iron Co. Awards totaled 2361 tons, the largest in over six weeks. Bids will be opened June 23 for 4400 tons for the Ford plant at Richmond, Calif. Plain shapes are firm at 2.35c, c.i.f.

Other Finished Material

Awards of cast iron pipe during the past two weeks have been especially light, less than 200 tons being reported booked. S. M. Milovich secured 110 tons for Fullerton, Calif. Bids will be opened June 13 for 153 tons for Long Beach, Calif. Bids opened this week included 265 tons for San Francisco, 384 tons for San Diego and 350 tons for Santa Ana, Calif. Los Angeles will open bids June 20 for 160 tons of ¾ to 2-inch extra heavy wrought iron pipe. No large pipe line inquiries are current.

Good Week at Seattle

Seattle, June 11.—Awards of iron and steel in the Pacific Northwest this week reached the largest totals of any week for a month. Additional contracts to be placed later this month involve considerable tonnage. However, the metal trades in this section are feeling the effects of general business depression and indications point to a dull period for 90 days.

Bars, Plates and Shapes

Mill prices of merchant bars remain unchanged at 2.35c while reinforcing bars are steady at 2.30c. The former item is not moving in volume while concrete bars show a fair aggregate in lots of 50 tons or less. No awards of 100 tons were noted this week. Both local mills report considerable business in carlots but specifications are less numerous for new construction, and less activity is expected during July and August. Northwest Steel Rolling Mills, Seattle, booked 50 tons for the Firestone Tire Co. building at Bellingham, Wash.

L. Coluccio, Seattle, has been given the general contract at $335,809 for construction of the approaches and piers for flanking spans of the Aurora avenue bridge, Seattle. This project involves 867 tons of reinforcing, 9 tons of steel rails, 6½ tons of steel castings and 26½ tons of structural steel. Sub-conracts are pending.

Plate awards include 375 tons for a 30-inch pipeline at Everett, Wash., taken by the Western Pipe & Steel Co., San Francisco, through J. W. Hoover, general contractor. Bids were opened June 9 for an irrigation project penstock at Vale, Oreg., 2200 tons of plates, referred to head offices at Denver. New jobs include 250 tons of plates and shapes for steel barges, placed with the Lake Washington Shipyards, Seattle, by the Foss Co. Plates are holding steady at the recently established mill level of 2.25c.

The largest structural award in several months, 1800 tons for the 14-story addition to the Meier & Frank department store, Portland, Oreg., was booked by Poole & McGonigle, Portland. General contract bids will be received June 22. DeYoung, Moscowitz & Rosenberg and Herman Brookman, Yeon building, are architects. Lindstrom & Feigenson, Portland, bidding $38,703, obtained the contract for the Clackamas river bridge, Oregon, requiring 166 tons of shapes. Seattle will again receive bids June 22 for four steel towers for the Duwamash river bridge, involving 115 tons of shapes. Shapes are unchanged at 2.35c. Structural steel awards are 15 to 20 per cent less than the corresponding period last year and no important projects have developed.

Freyn Will Build Russian Steel Plant

A steel plant having an annual output of 1,000,000 tons is to be built in Kuznetsk, U.S.S.R., by Freyn Engineering Co., Chicago, consulting engineers. An agreement to this effect was concluded recently with Novostal, Soviet Combine in charge of construction of new Russian steelworks.

The new steelworks, which will be known as Kuznetsky Works, will consist of four blast furnaces, 12 open-hearths, blooming mills, rail and structural mills, continuous billet mills, plate mills, four batteries of coke ovens, a power plant having a capacity of 96,000 kilowatts and all the auxiliaries required by a modern steel plant.

For the past three years Freyn Engineering Co. has been acting as general consultants to Gipromez, Soviet combine in charge of design and projection of new steelworks. Among the projects that were made under its direction is the one which is now to be executed by Novostal. The detail design of this steelworks will be carried out in Moscow and Leningrad, as well as at the construction site.

Freyn Engineering Co. will increase its engineering staff in U.S.S.R. to a total of fifty or sixty men. These American engineers will design and superintend the assembly, erection and initial operation of the steelworks. It is estimated that three years will be required to build this plant.

Much of the material used in the construction of Kuznetsky Works will be fabricated and manufactured in Soviet industrial plants, but special machinery, such as rolling mills, electrical equipment and the like, will be purchased in America or other foreign countries.

Iron, Steel Tariff Revision Is Mild

Eighteen Months of Discussion Leave Most Products Unchanged—Flexible Provisions Refined—New Act Effective Midnight, June 17

WASHINGTON, June 17.—Tariff revision, promised by Herbert Hoover in his campaign for president in 1928, became a fact today when he signed the Hawley-Smoot bill passed by the senate last Friday and the house Saturday.

The bill, enrolled and signed by the presiding officers of both houses, was received at the White House today. It supersedes the Fordney-McCumber act of 1922 at midnight June 17, as specified in the law.

In the statement announcing his intention of signing the measure, the President accepted it as fulfilling his pledge and being the best possible under the circumstances. According to the calculation at the White House, the new tariff imposes duties averaging 16 per cent of the total value of imports. The average duty under the 1922 tariff was 13.8 per cent, the Payne-Aldrich tariff 19.3 per cent and the Dingley tariff 25.8 per cent. There are 887 rate increases and 235 rate decreases in the new act. From 61 to 63 per cent of all imports will come in duty free.

In general, the Democratic minority in both houses opposed the measure, although party lines were broken in the South. The Democratic national committee has announced its intention of making the tariff the chief issue of the congressional elections in the fall. Emphasis will be laid upon the allegation that the cost of living will be greatly increased and that the revision helps industry rather than agriculture, for whose benefit limited modification was asked by the President.

Iron and Steel Changes Moderate

So far as the iron and steel industry is concerned, the changes are moderate. Pig iron remains unchanged at $1.12½ per ton. Ferromanganese, ferrosilicon, scrap and other raw materials are unchanged. The 1 cent a pound duty on manganese ore will be applicable to ore containing 10 per cent or more manganese, instead of 30 per cent. For a number of finished steel products slightly higher rates have been enacted. On the whole, however, the new rates vary slightly from the old ones, and the iron and steel industry has received only a small part of the increases it sought.

It has been 18 months since consideration of tariff changes was begun. Republican members of the house ways and means committee inaugurated hearings Jan. 7, 1929, concluding them Feb. 27. The resulting bill was introduced in the house May 7, 1929, and in three weeks, or on May 28, was passed.

The senate finance committee began hearings June 13, 1929, concluding them July 18. It reported the bill back to the senate Sept. 4, and debate began Sept. 12. Only last month did the senate finally act and send the measure to conference with the house to eliminate disagreements. The final vote in the senate came last Friday and in the house last Saturday.

As with the Fordney-McCumber tariff of 1922, which the current act supersedes, duties may be increased or decreased up to 50 per cent to meet a specific competitive situation. The new flexible provisions place more responsibility on the tariff commission and are intended to expedite action.

New Rates Outlined

Following are the more important iron and steel rates of the new law, indexed alphabetically:

A

ALUMINUM:
- Crude aluminum, scrap and alloys, 4c per pound.
- Coils, plates, sheets, rods, strips, etc., 7c per pound.

ANCHORS, iron or steel, and parts, 25 per cent.

ANVILS, jewelers' and other:
- Weighing less than 5 pounds, 45 per cent.
- All others, 3c per pound.

AXLES:
- Parts thereof, bars, blanks, forgings, not specially provided for, valued at not more than 6c per pound, 6/10c per pound.
- When fitted in wheels or parts of wheels duty is same as wheels in which they are fitted.

B

BABBITT METAL, 2½c per pound on lead contained.

BANDS:
- Valued at 3c per pound or less, 8 inches or less in width, thinner than ⅜-inch and not thinner than 109/1000-inch, 25/100c per pound; thinner than 109/1000-inch and not thinner than 38/1000-inch, 35/100c per pound; thinner than 38/1000-inch, 55/100c per pound.
- Bands and strip not specially provided for, 25 per cent.

BARS:
- Valued not above 1½c per pound, 3/10c per pound; above 1½ and not above 2½c, 5/10c per pound; above 2½ and not above 3½c, 8/10c per pound; above 3½ and not above 5c, 1c per pound; above 5 and not above 8c per pound, 1 7/10c per pound; above 8 and not above 12c, 2½c per pound; above 12 and not above 16c, 3½c per pound; above 16c, 20 per cent.
- Containing over 50 per cent tungsten, tungsten carbide, molybdenum or molybdenum carbide or combination thereof, 50 per cent.

BAR IRON:
- Valued not above 1½c per pound, 3/10c per pound; above 1½ and not above 2½c, 5/10c per pound; above 2½ and not above 3½c, 8/10c per pound; above 3½ and not above 5c, 1c per pound; above 5c, 1½c per pound.

BATTERIES, storage, complete or any parts, 40 per cent.

BEARINGS, roller or ball, finished or parts, 10c per pound and 45 per cent.

BILLETS, same as bars.

BLOOMS, same as bars.

BOLTS, iron or steel, with or without threads or nuts, and blanks, 1c per pound.

BRASS:
- Rods, sheets, bars, strips, Muntz metal, etc. 4c per pound.
- Seamless tubing, 8c.

C

CASTINGS:
- Malleable, not specially provided for, 20 per cent.
- Steel, same as steel bars.
- Gray iron, not specially provided for, 20 per cent.

CHAIN:
- Not less than ¾-inch diameter, ⅞c per pound; less than ¾-inch and not less than ⅜-inch, 1¼c per pound; less than ⅜-inch and not less than 5/16-inch, 2½c per pound; less than 5/16-inch, 4c per pound.
- Power transmissions, not more than 2-inch pitch and containing more than 3 parts per pitch, and parts thereof, finished and unfinished, 40 per cent; all other power transmission chain and parts, 35 per cent.
- Anchor or stud link, 2-inch or more in diameter, 1½c per pound; under 2-inch, 2c per pound.

COLD-FINISHED:
- Bars, rods, etc., ⅛c per pound over hot-rolled.
- Strip, plates, sheets, etc., 2/10c over hot-rolled.

CONCRETE REINFORCING BARS, same as bars.

COPPER:
- Rolls, rods, sheets, 2½c per pound.
- Seamless tubing, 7c per pound.
- Brazed tubes, 11c per pound.

COTTON TIES, ¼c per pound.

D

DIE BLOCKS, same as bars.

DRILLS:
- Twist, reamers, milling cutters, taps, dies, die heads, etc., and cutting edges, if suitable for cutting metal, not specially provided for, 50 per cent. Cutting tools of any kind containing more than 1/10 of 1 per cent vanadium or more than 2/10 of 1 per cent of tungsten, molybdenum or chromium, 60 per cent. The foregoing rates apply whether or not the articles are imported separately or as parts of or attached to machines, but not to holding or operating devices.
- Bits, gimlets, countersinks, planes, chisels, wrenches, etc., 45 per cent.

E

ENGINES, steam, 15 per cent.

F

FENCING, see wire.

FERROCHROME or ferrochromium:
- Containing 3 per cent or more carbon, 2½c per pound on contained chromium.
- Containing less than 3 per cent carbon, 30 per cent.

FERROMANGANESE:
- More than 1 per cent carbon, 1⅞c per pound on metallic manganese.
- One per cent carbon or less, 1⅞c per pound on maganese contained and 15 per cent.

(Ferromanganese is an iron manganese alloy containing 30 per cent or more of manganese.)

FERROPHOSPHORUS, 25 per cent.

FERROSILICON:
Eight to 59 per cent silicon, 2c per pound on silicon contained.
Sixty to 79 per cent silicon, 3c per pound on silicon contained.
Eighty to 89 per cent silicon, 4c per pound on silicon contained.
Ninety per cent or more silicon, 8c per pound on silicon contained.

FERROTITANIUM, 25 per cent.

FERROVANADIUM, 25 per cent.

FILES:
Blanks, rasps, etc.: 2½ inches in length and under, 25c per dozen; over 2½ and not over 4½ inches long, 47½c per dozen; over 4½ and under 7 inches long, 62½c per dozen; 7 inches and longer, 77½c per dozen.

FISHPLATES, ¼c per pound.

FLUORSPAR, containing above 93 per cent calcium fluoride, $5.60 per ton; containing not more than 93 per cent calcium fluoride, $8.40 per ton.

FORGINGS, not machined or tooled after forging, not specially provided for, 25 per cent.

G

GRIT, iron or steel, ¾c per pound.

H

HAMMERS:
Blacksmith, 1⅜c per pound.

HARDWARE, saddlery:
Unplated, 50 per cent.
Plated, 60 per cent.

HOOPS, see bands.

I

INGOTS, same as bars.

INSTRUMENTS:
Scientific, laboratory, etc., unplated, 40 per cent.
Drawing, 45 per cent.
Surgical, 55 per cent.

IRON:
Kentledge, $1.12½ per ton.
Ore, free.
Pig, $1.12½ per ton.
Sponge, $2.25 per ton.

KNIVES:
Planing-machine, roll bars, bed plates, shear blades, etc., 20 per cent.

L

LEAD, bullion, pigs, bars, etc., 2⅛c per pound.

M

MAGNESITE:
Crude, 15/32c per pound.
Dead-burned, 23/40c per pound.

MANGANESE:
Ore or concentrates, over 10 per cent manganese, 1c per pound on metallic manganese.
Metal, silicon, boron, etc., 1⅞c per pound on metallic manganese and 15 per cent.

MOLYBDENUM:
Ore or concentrates, 35c per pound on metallic content.
Metallic, powder, all other compounds and alloys of, 50c per pound on molybdenum contained and 15 per cent.

MUCK BARS, same as bar iron.

N

NAILS:
Wire, including spikes, tacks, brads and staples, not less than 1 inch long or smaller than 65/1000-inch in diameter, 4/10c per pound; under 1 inch in length and smaller than 65/1000-inch in diameter, ¾c per pound.
Cut, exceeding 2 inches in length, 4/10c per pound; not exceeding 2 inches in length, 15 per cent.
Horseshoe, 1½c per pound.
Upholstery and thumb tacks, 3c per pound.
Staples in strip form for use in paper fastener or stapling machines, 6/10c per pound.
Spikes, tacks, brads and staples not specially provided for, 6/10c per pound.

NICKEL:
Pigs, ingots, etc., 3c per pound.
Bars, rods, plates, sheets, strip, etc., 25 per cent.
Above, when cold-rolled or worked, 10 per cent additional.

NUTS and nut blanks, wrought iron or steel, 6/10c per pound.
Spiral locks, 35 per cent.

P

PATTERNS, molders', 50 per cent.

PILING, SHEET, 1/5c per pound.

PIPE:
Cast iron, and fittings for, 25 per cent.
Steel or wrought iron tubes, pipes, flues and stays, not thinner than 65/1000-inch, not less than ⅝-inch diameter, ¾c per pound; less than ⅝ and not less than ¼-inch diameter, 1¼c per pound; less than ¼-inch diameter, 1¾c per pound. Charcoal iron tubes, etc., minimum of 1¼c per pound.
Flexible metal tubing or hose, whether covered with wire or other material, and tubes or pipe lined or coated for use as electrical conduit, 30 per cent.
Unfinished iron or steel tubes not specially provided for, 25 per cent.

PLATES:
Iron or steel, except crucible and saw plate steel, not thinner than 109/1000-inch, valued not above 3c per pound, 5/10c per pound; valued over 3c per pound, 20 per cent.
Not specially provided for, same as bars.
All sheets or plates thinner than 109/1000-inch dutiable as sheets.

PLIERS, 60 per cent.

R

REAMERS, see drills.

RIVETS:
Rivets, studs and steel points, lathed, machined or brightened, and rivets or studs for non-skidding automobile tires, 30 per cent.
Rivets of iron and steel not specially provided for, 1c per pound.

RODS, WIRE:
All classifications, in coils, or otherwise, valued at not over 4c per pound, 3/10c per pound; valued over 4c per pound, 6/10c per pound.
Rods under 21/100-inch dutiable as wire.
All rods tempered or treated or partially manufactured, additional ¼c per pound.

ROLLS, cylindrical ground and polished, valued at more than 25c per pound, 25 per cent.

S

SASHES, iron or steel, 25 per cent.

SAWS:
Crosscut, mill, pit and drag, circular, band, hand, back, etc., 20 per cent.
Jewelers' and piercing, 40c per gross.

SCALE:
Roll, mill or hammer, 75c per ton.

SCRAP:
Wrought, cast and steel, 75c per ton.

SCREWS, iron or steel, 25 per cent.

SHAFTING, same as bars.

SHEET PILING, see piling.

SHEETS:
Black: valued at 3c per pound or less and thinner than 109/1000-inch and not thinner than 38/1000-inch, 45/100c per pound; thinner than 38/1000-inch and not thinner than 22/1000-inch, 55/100c per pound; thinner than 22/1000-inch and not thinner than 10/1000-inch, 75/100c per pound; thinner than 10/1000-inch, 85/100c per pound. Corrugated or crimped, 75/100c per pound. All the foregoing when valued at more than 3c per pound, 20 per cent.
Galvanized sheets, 2/10c per pound more than comparable common black.
Polished, planished, or glanced, 1¼c per pound.
Pickled, cleaned, etc., other than polished, planished, etc., 2/10c per pound more than common black.
Cold-rolled, smoothed only, 2/10c per pound more than common black.
Sheets of any metal with other metals imposed thereon by forging, hammering, rolling or welding, 30 per cent.
Not specially provided for, same as bars.
All sheets not thinner than 109/1000-inch dutiable as plates.

SHOT, iron or steel, ¾c per pound.

SHOES:
Horse, mule, etc., wrought iron or steel, 1/5c per pound.
Same when punched, drilled, etc., for use with adjustable calks, and solid drop-forged calked shoes, 1c per pound.

SKELP:
Valued not above 3c per pound and sheared or rolled in grooves, 5/10c per pound.
Valued at 3c per pound and less, same as black sheets.

SLABS, same as bars.

SLEDGES, 1⅝c per pound.

SOLDER, 2⅛c per pound on lead contained.

SPADES, shovels, etc., 30 per cent.

SPIEGELEISEN:
More than 1 per cent carbon, 75c per ton.
One per cent carbon or less, 1⅞c per pound on manganese contained and 15 per cent.
(Spiegeleisen is an iron manganese alloy containing less than 30 per cent manganese.)

STAPLES, see nails.

STEEL SHAVINGS, 5c per pound and 30 per cent.

STEEL WOOL, 10c per pound and 30 per cent.

STILLS (reaction chambers, drums, converters, ovens, penstock pipes) not cast, if over 20 inches at largest diameter, exclusive of nonmetallic lining, having walls 1¼ inch or more thick, 35 per cent.

STRIP, see bands.

STRUCTURALS (beams, girders, joists, angles, channels, car-truck channels, tees, columns, posts, parts or sections of columns and posts, deck and bulb beams):
Not fabricated, 1/5c per pound.
Drilled, assembled, fabricated, etc., 20 per cent.

T

TANKS, including pressure, 25 per cent. See also stills.

TERNE PLATE, 1c per pound.

THERMOSTATIC metal, 50 per cent.

TIE PLATES, ¼c per pound.

TIN PLATE, 1c per pound.

TOOLS, metal-cutting, see drills.

TUBES and tubing, see pipe.

TUNGSTEN:
Ore or concentrates, 50c per pound on metallic tungsten contained.
Metal, carbide and mixture or combinations containing tungsten metal or carbide, in lumps, grain or powder, 60c per pound on tungsten contained and 50 per cent.
Tungstic acid and all other compounds of tungsten not specially provided for, 60c per pound on tungsten contained and 40 per cent.
Ferrotungsten, ferrochromium tungsten, chromium tungsten, chromium cobalt tungsten, tungsten nickel and all other alloys of tungsten not specially provided for, 60c per pound on tungsten contained and 25 per cent.

V

VANADIUM, 25 per cent.

W

WASHERS:
Wrought iron or steel, 6/10c per pound.
Lock, iron or steel, 35 per cent.

WHEELS:
Railway, wholly or partly finished, 1c per pound.
When fitted with axles, duty on wheels applies to assembly.

WIRE:
Round iron or steel, not smaller than 95/1000-inch, ¾c per pound; smaller than 95/1000-inch and not smaller than 65/1000-inch, 1¼c per pound; smaller than 65/1000, 1½c per pound.
All the foregoing when valued above 6c per pound, 25 per cent.
Flat wire and strip not thicker than ¼-inch, and not over 16 inches wide, 25 per cent.
All coated, dipped, sherardized, galvanized, etc., wire, additional duty of 2/10c per pound.
Telegraph or telephone, covered, coated, etc., 35 per cent.
Wire rope and strand, 35 per cent.
Spinning and twisting ring travelers, 35 per cent.
Heddles and healds, 25c per 1000 and 30 per cent.
Hay baling, ½c per pound.
Galvanized fencing composed of wires not larger than 21/100-inch and not smaller than 8/100-inch, ½c per pound.
Galvanized for fencing, not larger than 21/100- and not smaller than 8/100-inch, ½c per pound.

WOVEN-WIRE CLOTH:
All material, meshes not finer than 30 wires to lineal inch in warp or filling, 25 per cent; finer than 30 and not finer than 90 wires, 40 per cent; finer than 90 wires, 50 per cent.

WRENCHES, 45 per cent.

Z

ZINC:
Blocks, pigs, slab or dust, 1¾c per pound.
Sheets, 2c per pound.

Will Add New Pipe Mill

Youngstown Sheet & Tube Co. will build at its Brier Hill plant a 16 and 24-inch electric weld pipe mill employing a new process. Contracts for the mill building have been let and the mill is expected to start late in the summer.

The process of welding will be by induction employing a high-frequency, high-voltage, low-amperage current. Other mills making smaller sizes are planned to be built in the near future.

Here and There in Industry

Timely Information Which Records Developments in Various Lines of Productive Enterprise

WILLIAM SWINDELL & BROS., American Dressler Tunnel Kilns. Inc., Gas Combustion Co. and Duquesne Burner Service Co. have consolidated to form the Swindell-Dressler Corp., with offices and plant at Pittsburgh. William Swindell & Bros. have built furnaces for the steel and allied trades for 80 years. At present they manufacture combustion and electric furnaces for ferrous and nonferrous melting, heat treating and annealing. American Dressler Tunnel Kilns Inc. designs and builds continuous furnaces for heat treating and annealing, and tunnel kilns for the ceramic field. Gas Combustion Co. manufactures pressure burners for blast furnace boilers and stoves, and a safety device for preventing fly wheel explosions. Duquesne Burner Service manufactures gas burners for industrial and heating boilers and industrial furnaces. As the consolidation marks the eightieth anniversary of the founding of William Swindell & Bros., the oldest company in the consolidation, a book, "Eighty Years of Progress," has been issued commemorating this event. Officers of the Swindell-Dressler Corp. include: John F. Casey, president; Philip Dressler, William H. Cosgrove, Frank W. Brooke and Ralph W. Porter, vice presidents; Samuel B. Casey, treasurer; Ralph E. Whittaker, secretary; H. W. Paret Jr., manager burner division; L. A. Vincent, sales manager.

* * *

AIR REDUCTION CO. INC. has moved its executive offices from 342 Madison avenue to the Lincoln building, on Forty-second street opposite the Grand Central Terminal, New York.

* * *

AMERICAN ARCH CO. INC., manufacturer of air-cooled walls and suspended arches for boiler and industrial furnaces, has moved its main offices from 17 East Forty-second street to the Lincoln building, 60 East Forty-second street, New York.

* * *

BANTING MFG. CO., Toledo, O., will be sold at auction June 25, by the Industrial Plants Corp., New York, under court order. Sale covers machinery and materials, which will be offered piecemeal but not as a whole.

* * *

PREST-O-LITE CO. INC., 30 East Forty-second street, New York, has established a plant for the manufacture of dissolved acetylene at 1240 Stewart avenue S.W., Atlanta, Ga. The former plant at 345 Kuhrt street S.W. will be discontinued.

* * *

TITAN ELECTRIC CO., Adrian, Mich., has been reorganized, recapitalized and incorporated. It is located in a new plant and is devoted to the manufacture of fractional electric motors, generators, grinders and buffers and pump jacks.

* * *

BORG WARNER SERVICE PARTS CO., automotive replacement parts, a subsidiary of Borg Warner Corp., Chicago, has established a parts warehouse at 422 South Seventh street, Minneapolis, to serve territory in Minnesota, the Dakotas, northern Wisconsin and upper Michigan.

* * *

STEWART-BROWN STEEL CORP., Detroit, recently incorporated, will do a general jobbing business in strip and sheet steel. Its warehouse is located at 10571 Grand River avenue and will be equipped to shear to size. Port B. Stewart and George D. Brown are in charge of the company.

* * *

AMERICAN LOCOMOTIVE CO., Schenectady, N. Y., which has ceased the manufacture of locomotives at its plant at Dunkirk, N. Y., and undertaken production of specialties, has received an order for a large tonnage of 72-inch steel pipe for Detroit and 650 tons of bronze valves for New York.

* * *

MONTERREY IRON & STEEL WORKS, Mexico City, Mex., finds 1929 was highly successful. Total production was 100,000 tons, 20 per cent above 1928, with 84,000 tons of structural and finished materials, which is 35 per cent above 1928. Dividends of about 50 cents per share have been paid annually for the past five years. The company is capitalized for about $5,000,000. In 1929 profits were slightly under $500,000. The main works are in Monterrey, Mex. It has the only blast furnace in Latin America.

* * *

LEINERT VALVE CO., Chicago, has just closed one of the largest orders for check valves in the Chicago district. The order includes 12 automatic check valves for gas line connections for blast furnace blowing engines, of 1,080,000 cubic feet capacity per minute, and three check valves for turbine blowers of 150,000 cubic feet per minute.

* * *

LAUSON CORP. has been organized to succeed the John Lauson Mfg. Co., New Holstein, Wis., manufacturer of farm and road tractors, gasoline engines, snow traveling attachments for passenger and commercial automobiles, and similar specialties. The capital stock consists of $100,000 preferred shares and $522,988.58 in common stock. F. D. Edson is president, H. N. Edens vice-president, and Clifford O. Piper secretary and treasurer.

* * *

BLAW-KNOX INTERNATIONAL CORP. is the new name for the export organization of the Blaw-Knox Co., which formerly was known as the Milliken Brothers-Blaw-Knox Corp., which was the successor of Milliken Brothers Mfg. Co. The name is changed to accord with the larger scope of activities and identifies the export company as such. No change is to be made in personnel and the offices remain in the Canadian-Pacific building in New York. The company handles all products of the Blaw-Knox Co., Pittsburgh, in South America, the West Indies and other parts of the world where the Blaw-Knox Co. is not otherwise represented.

* * *

AUSTIN CO., Cleveland, has a contract from the Wildman Mfg. Co., Norristown, Pa., manufacturer of knitting machinery, for an addition to its plant, 100 x 200 feet, of steel frame construction. Another contract is for a building at Emerville, Calif., to be leased to the American Tractor Equipment Co. It will be used as a welding shop and assembly room for dirt-handling equipment for tractors. It will be of steel construction, 90 x

100 feet, and will be equipped with a three-ton traveling bridge crane. Stearman Aircraft Co., Wichita, Kans., has given the Austin Co. a contract for an airplane manufacturing plant, embodying straight-line manufacturing equipment.

* * *

KULKA IRON & METAL CO., Alliance, O., has bought the plant of the Alliance Aircraft Corp. at sheriff sale and is planning to resell to a new company to be formed to resume production of airplanes.

* * *

NATIONAL HARRIS WIRE CO. INC., Newark, N. J., manufacturer of wire in metals and alloys, has opened a western factory unit at 1215 Washington boulevard, Chicago, in charge of Arthur J. Benson.

* * *

SANITARY MFG. CO., Port Hope, Ont., J. A. Kilpatrick president, has sold a controlling interest for $2,000,000. The purchaser is said to be Crane Ltd., 1170 Beaver Hall square, Montreal, Que.

* * *

WEBSTER & WEBSTER, East Hartford, Conn., have been awarded the contract for 195,625 feet of wire rope railing with anchorages and posts, for state of Connecticut requirements.

* * *

BRAZIL STAMPING & MFG. CO., 3244 West Lake street Chicago, metal stampings and stamping products, is leasing a 1-story factory building at Laramie avenue and West Sixty-fifth street, containing 25,000 square feet of working space.

* * *

BURNS MACHINE CO., Racine, Wis., dealing in new and used tools, mill supplies, factory equipment, etc., has moved from the Sattley building to 1043 Washington avenue, Racine, gaining substantially in office and warehouse space.

* * *

SPECIALTY BRASS CO., Kenosha, Wis., has received an order from the Badeker Mfg. Co., Chicago, manufacturing packing rings for locomotives, for its entire supply of brass castings, on a continuing basis. At the present rate, the order is valued at $40,000 annually.

* * *

TAYLOR-WHARTON IRON & STEEL CO., High Bridge, N. J., producer and founder of iron and steel since 1742, and the original producer of managanese steels in this country, has added an alloy steel division for the manufacture on a production basis of Tisco Nirosta KA2 castings for corrosion and heat resistant applications. The line includes marine castings, ornamental hardware, and castings for the industrial field generally. The new division, which has been operating for some time, is the result of a year's experimental work.

* * *

CHICAGO SMELTING & REFINING CO., 2457 South Loomis street, Chicago, white metal smelter, has taken over the former Imperial Metal Corp., 1122 Frank street, Chicago. I. Lippa, president of the Imperial corporation, now is associated with the Chicago Smelting & Refining Co.

* * *

EDGAR T. WARD'S SONS CO., division of Columbia Steel & Shafting Co., Will erect a 1-story building, 125 x 242 feet, at 4834-44 South street, Louis avenue, in the Central Manufacturing district, Chicago, and move its operations there. Ground space is provided for future expansion. A. Epstein, 2001 Pershing road, Chicago, is architect.

* * *

WESTINGHOUSE ELECTRIC & MFG. CO., East Pittsburgh, Pa., has received a contract from the Union Electric Light & Power Co. for electrical equipment to cost $1,000,000 for installation at the latter's plant at Bagnell, Mo. The order includes five umbrella-type vertical water wheel generators and seven 150-kilowatt motor-generator exciter sets.

* * *

ART METAL CONSTRUCTION CO., Jamestown, N. Y., manufacturer of steel office furniture and equipment, has taken a long-term lease on the entire second floor of the Lovejoy Industrial building, 2109 South LaSalle street, Chicago. The space, 18,000 square feet, will be used for warehouse and service purposes. Sales offices will remain at 173 West Madison street, Chicago.

* * *

ACME STEEL CO., Chicago, in the five months ended April 30 had net profit in excess of $500,000 after all charges, including federal taxes, equal to about $1.45 a share on 343,046 common shares outstanding. This was slightly below dividend requirements for the period. No comparison is available for the corresponding period last year. Net for the six months ended June 30, 1929, was $1,781,671, or $5.04 a share on stock now outstanding.

* * *

NATIONAL MACHINERY CO., Tiffin, O., has re-elected its officers for the coming year. Earl R. Frost is president, Mrs. Augusta Rohn vice president, Henry J. Weller secretary, Joseph P. Bork assistant secretary, and William L. Hertzer treasurer. These officers, with John H. Friedman, G. R. Ayres, Dr. Charles E. Miller and William L. Clouse, all of Tiffin; George H. Porter, New York, and Val B. Holman, Philadelphia, form the board of directors.

* * *

GENERAL STEEL CASTINGS CORP., Commonwealth division, Granite City, Ill., has received an order for 25 locomotive beds for the Union Pacific railroad, each 60 feet in length and weighing 82 tons.

Plate Maker Engages in Welded Steel Work

Announcement is made by Robert W. Wolcott, president, Lukens Steel Co., Coatesville, Pa., of the entry of this company into the field of supplying welded steel construction to the manufacturers of machinery and equipment. Research and development work in this connection have been going forward for several months and approximately 50,000 square feet of manufacturing space have been provided at the Coatesville plant for this activity.

Operations in this field will be carried on through a subsidiary company known as Lukenweld Inc., which for the present will utilize some of the manufacturing facilities of the parent company. Mr. Wolcott states that rapidly increasing demand on the part of machinery and equipment buyers for welded steel construction is responsible for the new development. An extensive program of development and research work has been laid out to assure the safety and economy of welded steel design. The company is prepared to furnish engineering assistance to users of this class of construction through a development and research division.

The new company has 24 operators working at the present time and expects to have 50 in production within the next 60 days. G. D. Spackman is president of Lukenweld Inc.

Start Gulf Plate Mill

Birmingham, Ala., June 17.—Gulf States Steel Co. has started its new universal plate mill at Gadsden, Ala., and after further aligning of machinery, steady operation will be under way. This is part of a $6,000,000 development program, the company has authorized this year. A new continuous sheet mill will be in operation in a month.

Obituaries

DR. ELMER AMBROSE SPERRY, 70, engineer, inventor and scientist, died June 16 at New York from the effects of an operation undergone several weeks ago. He was born in Cortland, N. Y., Oct. 12, 1860, where he attended State Normal school. He later spent the college year 1879-1880 at Cornell university. In 1880 he founded the Sperry Electric Co., Chicago, and in 1890 organized the Sperry Electric Railway Co., Cleveland, whose patents were purchased in 1894 by General Electric Co.

Holder of more than 400 patents, mostly upon electrical appliances, Dr. Sperry chiefly is known for the Sperry gyroscope. The Sperry Gyroscope Co. was formed in 1910 and was sold two years ago to the Curtiss Airplane Co. Dr. Sperry was elected president of the American Society of Mechanical Engineers in December, 1928, and in October, 1929, was presented the Gary Bronze medal by the American Iron and Steel institute for the best paper presented before it during 1928. The address was a discussion of Alfred V. de Forest's paper on "Uniformity, Continuity and Magnetic Testing," presented before the October, 1928, gathering of the institute.

* * *

Col. William Enders, 79, vice president of Simmons Hardware Co., St. Louis, with which he was connected for half a century, died recently at his home in St. Louis. He was a native of Paducah, Ky.

* * *

Gilbert N. Hall, 22, vice president of L. Norris Hall Inc., Philadelphia, jobber, and son of L. Norris Hall, was drowned June 14 in a lake near Browns Mills, N. J. He was graduated from the University of Pennsylvania a year ago.

* * *

Edward Jewett Brooks, 83, head of E. J. Brooks & Co., Newark, N. J., manufacturers of metal goods, died May 31 in East Orange, N. J., where he had lived for 50 years. He was active in the business until his recent illness.

* * *

Otto P. Kamschulte, 55, head of Otto P. Kamschulte Co., Milwaukee, manufacturer of tools, dies, etc., died June 6 at Milwaukee. After serving as chief engineer in the United States navy, he became associated with Allis-Chalmers Mfg. Co., and later established his own company.

* * *

Alexander L. Greenabaum, 50, vice president of O. F. Jordan Co., East Chicago, Ind., manufacturer of spreaders, ditchers, etc., died June 4 at Chicago. He was born at Wilmington, N. C., and became connected with the Jordan company in 1920. He was elected president of National Railway Appliances association in March, 1928.

DR. ELMER AMBROSE SPERRY

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Sidney A. Keller, a founder and for many years president of the Keller Mechanical Engineering Corp., Brooklyn, N. Y., died June 4.

* * *

Edward Taggart Child, 58, an engineer prominent in the shipbuilding and foundry industries, died June 8 at New York. He was connected with the Southwark Foundry Co., Philadelphia, for 20 years. During the World war Mr. Child represented Le Parmentier Shipbuilding Co., New York. At the time of his death he was secretary-treasurer of David Baker Inc., New York, consulting engineer.

* * *

Mark L. Miller, in charge of field work in connection with structural steel used on various power plants of the Detroit-Edison Co., Detroit, died recently, in an automobile accident. His brother, Lee H. Miller, is chief engineer of the American Institute of Steel Construction. Mark Miller, who was 51, was graduated from the University of Toronto in 1903 as an engineer. He was employed by Hamilton Bridge Works, Hamilton, Ont., and later became shop manager at Rankin, Pa., for McClintic-Marshall Co.

Pennsylvania Rates To Be Heard July 9

Pittsburgh, June 17.—Producers and consumers of iron and steel products will be provided an opportunity on July 9 to present their protests against existing freight rates in the Pittsburgh district. This date has been set for the hearing before the Pennsylvania public service commission, following the postponement from the original date of June 18. The hearing will be held in Pittsburgh.

Shippers will seek a suspension of present rates similar to the action already taken in Indiana and Illinois. The increased rates were put into effect through an order of the interstate commerce commission but as the particular schedule under fire is intrastate, shippers contend that it can be suspended by the state commission.

Shippers meanwhile are seeking other means of transportation in attempts to counteract the sharp increase in freight charges on the movement of iron and steel products to nearby points. The Carnegie Steel Co. is employing special trucks with a capacity of 15 tons each in moving steel from its Homestead works to McKeesport. The rail rate on this haul was increased from $0.73 to $1.30 a ton. Increased use of river facilities also is contemplated to offset a prospective $2,000,000 boost in annual freight bills of the district.

The Hartford, Conn., chapter of the American Society for Steel Treating, recently elected the following officers for 1930-31; Chairman, Henry J. Fischbeck, Pratt & Whitney Aircraft Co.; vice chairman, H. I. Moore, Firth-Sterling Steel Co., and secretary, L. H. Knapp, Hartford Electric Light Co.

Industrial Men in the Day's News

Franklin Farrel Jr., Recently Made Chairman Farrel-Birmingham Co. Inc., Ansonia, Conn.

AFTER an affiliation of 27 years he now is board chairman of the company founded by his father in 1848.

HIS gradual rise to that position has come through hard work in various and numerous capacities, latterly as vice president.

GRANTED leave of absence, April, 1917, *he became a United States navy ensign and was honorably discharged in January,* 1919, *as senior lieutenant.*

CHILLED rolls, heavy machinery and castings heretofore have been closely identified with the entire business career of Franklin Farrel Jr., who Feb. 20 was elected chairman of Farrel-Birmingham Co. Inc., Ansonia, Conn., as noted in IRON TRADE REVIEW of March 6. That career extends over a period of 27 years, starting in 1903 when he was graduated from Yale university with a B. A. degree. He was born Aug. 27, 1881, in Ansonia, where his father, the late Franklin Farrel, was known as a capable and successful captain of industry, being a pioneer in the industrial development of the Naugatuck valley.

The younger Franklin Farrel attended public schools in Ansonia, Hopkins grammar school, New Haven, Conn., and St. Paul's school, Concord, N. H., preparatory to attending Yale university. Upon leaving the latter institution, it was natural he should enter the business founded by his father in 1848, the Farrel Foundry & Machine Co. He since has served that organization and its successor, the Farrel-Birmingham Co. Inc., in various capacities. Prior to his election as board chairman he was vice president for a number of years. Farrel-Birmingham Co. Inc. is the name by which the corporation has been known since it acquired the Birmingham Iron Foundry, established in 1836. The merged interests have plants at Ansonia and Derby, Conn., and at Buffalo.

Mr. Farrel's service has been continuous since 1903, except for a leave of absence granted him April, 1917, during the World war. He was in the service of the United States navy, serving first as an ensign and later as lieutenant of the senior grade, with which rank he was honorably discharged in January, 1919. For that service he was honored with a special letter of commendation from the secretary of the navy, who also conferred upon him a silver star.

Mr. Farrel is a member of the Union League club, Yale Club of New York, Automobile Society of America, D. K. E., Elihu club, New Haven Country club, Graduates' Club of New Haven, founder-member of the Army, Navy and Marine Corps Country club, Yeomen's Hall, Charleston, S. C., Society of Colonial Wars, Sons of American Revolution, New Haven Lawn club, and Pine Orchard club. His favorite recreations are boating and flying, having become an ardent aviation enthusiast. He is temporary chairman of the Municipal Air board, New Haven, and is assisting in establishing the municipal airport, recently dedicated.

HAROLD S. FALK, vice president and works manager of the Falk Corp., Milwaukee, manufacturer of gears, steel castings, etc., received an honorary degree as master of science from Marquette university, Milwaukee, in recognition of work done by him in promotion apprentice training movement in American industries. The honor was conferred upon him during commencement exercises held June 11. In addition to building up an effective apprentice training system in his own plant, Mr. Falk for ten years has been chairman of the apprenticeship com-

mittee of National Metal Trades association in Milwaukee, where under his direction the number of apprentices in the machinery building industries has grown from about 400 in 1920 to approximately 1100 at present.

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Ernest J. Opie recently was appointed general superintendent of Girard Model Works Inc., Girard, Pa.

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Chelsea L. Baily, special representative at Chicago of Republic Steel Corp., Youngstown, O., has been transferred to Cincinnati.

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William W. Coleman, chairman and president, Bucyrus-Erie Co., South Milwaukee, Wis., has been elected a director of the American Brake Shoe & Foundry Co., New York.

* * *

Fletcher Crawford, manager of the Blackhawk Steel & Iron Co., Rockford, Ill., has been made district representative at Rockford for E. P. Bartlett Co., Chicago, dealer in steel.

* * *

Horace Armstrong, secretary and sales manager of Armstrong Bros. Tool Co., Chicago, has sailed for an extended tour of 12 European countries in the interests of his company's products.

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E. O. Burgham, formerly assistant manager of the tin plate plant, has been made manager, and A. Kadell, assistant manager of night turn, has been appointed assistant manager of the tin plate department.

* * *

H. G. Dalton, vice president of Pickands, Mather & Co., Cleveland, was recently appointed by President Hoover to serve on the committee investigating matters pending before the United States shipping board.

* * *

Carl H. Morken, formerly plant metallurgist of Ohio Brass Co., Mansfield, O., has been appointed foundry engineer for Detroit Electric Furnace Co., Detroit. He will be identified with its sales and service division.

* * *

Thompson A. Lyon, for the past ten years superintendent of Davis & Hemphill Co., Elkridge, Md., manufacturer of screw machine products, has been appointed plant superintendent of Alexander Milburn Co., Baltimore, manufacturer of oxyacetylene apparatus and kindred products.

* * *

E. W. Rieger, formerly manager of the tin plate plant of Weirton Steel Co., Weirton, W. Va., has been appointed manager of all sheet and tin plate mills of the company to succeed J. M. Hill, who resigned to become affiliated with Republic Steel Corp.

* * *

W. H. Rinearson, vice president and general manager of the Armco Culvert Manufacturers' association, Middletown, O., has resigned to become vice president in charge of sales of the A. M. Byers Co., Pittsburgh. He succeeds L. M. Johnston, resigned. J. W. Marrinan, assistant to the president of the Byers company, has been elected a vice president.

* * *

C. E. Stephens has been appointed commercial vice president for the Atlantic district with headquarters in New York, for the Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa. N. G. Symonds will discharge similar duties for the central division and will be located in Chicago, and W. R. Marshall will serve for the Pacific division in San Francisco. Each has been district manager in his respective territory and will retain the duties of that position.

HAROLD S. FALK

* * *

Eugene C. Bauer was recently elected president and chairman of the board of Kensington Steel Co., Chicago, to succeed the late Walter S. McKee. Mr. Bauer was one of the company's founders and for many years was associated with Mr. McKee, latterly as vice president.

Kenneth Jensen, formerly general manager, has been made vice president and general manager.

* * *

L. W. Chubb, former manager of the radio engineering department of the Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa., has returned to the company as director of the Westinghouse research laboratories. For some months he has been located in Camden, W. Va., as assistant to the vice president of the Radio Victor Co. He now succeeds S. M. Kintner, recently made assistant vice president.

* * *

R. W. Carlisle, Indiana Pythian building, Indianapolis, has been appointed factory representative for Ohio Electric Mfg. Co., Cleveland, in the sale of its complete line of fractional horsepower motors.

* * *

John C. Woodison, who has been vice president and secretary of E. J. Woodison Co., Detroit, manufacturer of foundry equipment, foundry facings, etc., will succeed as president the late Edward J. Woodison, whose death was noted in IRON TRADE REVIEW of June 12.

* * *

Max Kuniansky, formerly works manager of Lynchburg Foundry Co., Lynchburg, Va., has been appointed works manager of the company's Radford, Va., plant. Born in Russia, March 30, 1899, he came to this country in 1907. He was graduated from Georgia School of Technology in 1919 with a B. S. degree in engineering chemistry. After brief periods with Aetna Explosive Co., New York, and National Malleable Castings Co., Cleveland, now the National Malleable & Steel Castings Co., he became associated with American Cast Iron Pipe Co., Birmingham, Ala., in 1920. In September, 1923, he became metallurgist for Lynchburg Foundry Co. and was appointed works manager at Lynchburg Jan. 1, 1923, and held that position until his appointment May 1, 1930, as Radford works manager.

* * *

Dr. O. E. Harder, in charge of metallography at the University of Minnesota, has been appointed assistant director of Battelle Memorial institute, Columbus, O. He is a specialist in physical metallurgy, heat treatment, and allied subjects, and will devote a portion of his time to the work being conducted at the institute by the alloys of iron committee of the engineering foundation.

Dr. Harder has been active in the American Society for Steel Treating, being on its national board of directors. He also has been chairman of the Minnesota section of the American Chemical society and served on various committees of the American Society for Testing Materials and the American Institute of Mining and Metallurgical Engineers. He has published numerous papers and was awarded the Howe medal of the

American Society for Steel Treating for his researches on the decomposition of the austenitic structure in steel.

* * *

Herbert Hoover, since 1923 general distribution engineer for Potomac Electric Power Co., has become affiliated with sales department of Wagner Electric Corp., St. Louis, to represent it in North Carolina and Virginia.

* * *

B. W. Marron, general manager of the Buffalo plant of Hanna Furnace Co., Cleveland, has resigned effective July 1 to retire from active business. He has rounded out 50 years in blast furnace operation, mainly with the Hanna interests. He recently returned from a trip around the world.

* * *

J. C. Gore resigned as sales manager of St. Louis Gas & Coke Corp., St. Louis, effective June 15. Mr. Gore, for 13 years connected with the sales force of Domhoff-Joyce Co., went with the St. Louis Gas & Coke Corp. seven years ago as assistant sales manager at Chicago. He has been head of the sales department since 1928.

* * *

Clayton R. Burt, president and general manager, Pratt & Whitney Co., Hartford, Conn., was elected president of the Manufacturers' Association of Hartford County, Hartford, June 12.

George E. Bean, general manager, Vulcan Iron Works, New Britain, Conn., was elected first vice president, and Samuel M. Stone, president, Colt's Patent Fire Arms Mfg. Co., second vice president.

* * *

George W. Sells, assistant manager at Waukegan, Ill., for American Steel & Wire Co., Chicago, retired June 6. He was born in Waukegan and for years was assistant superintendent of the company's plant there but later went to Joliet, Ill., as superintendent. He then was transferred to Worcester, Mass., as superintendent but latterly has been assistant manager of the Waukegan district.

* * *

Scott Turner, director of United States bureau of mines, Washington, who as noted in IRON TRADE REVIEW of Feb. 27, 1930, was elected vice president of American Institute of Mining and Metallurgical Engineers, has been notified by the secretary of state that he has been designated a delegate from the United States to attend the second plenary meeting of the World Power conference at Berlin late in June. From the same source he also has been notified of his appointment as one of two American delegates to the International Congress of Mining Metallurgy and Applied Geology to be held at Liege, Belgium, about the same time. Mr. Turner also is an official delegate of the American committee of the World Power conference.

* * *

T. D. McCloskey, Pittsburgh attorney, has been elected president of American Stainless Steel Co., Pittsburgh, to succeed the late E. A. Starbuck. Mr. McCloskey has been a director of the company since its incorporation.

J. C. C. Holding, for the past four years manager of the company, has been elected vice president and manager and will be in direct charge of the company's activities. Mr. Holding

J. C. C. HOLDING

is a civil engineering graduate of the Rose Polytechnic institute, Terre Haute, Ind., and has been identified with the steel industry for a number of years. Following his college career he was connected with Carnegie Steel Co., Pittsburgh, in drafting and sales work. He went to Philadelphia in 1917 as manager of the railroad and structural bureaus of the Midvale Steel & Ordnance Co. In 1926 he returned to Pittsburgh as manager of the American Stainless Steel Co.

Charles S. Bunting continues as secretary-treasurer of the company.

* * *

R. S. Hall, formerly president of the Bourne-Fuller Co., Cleveland, has been formally named vice president in charge of operations and sales of the Upton Nut division of Republic Steel Corp., Youngstown, with which Bourne-Fuller Co. recently was merged. The Upson nut division will be devoted to the production and sale of bolts and nuts from the Cleveland and Muncie, Ind., plants. Other Republic appointments follow:

K. D. Mann has been appointed district sales manager, Birmingham, Ala.; W. A. Peck, manager of Cincinnati district; George W. Way, manager of Dallas, Tex., district; F. M. Welch, manager of Pittsburgh district; G. F. Emanuels, manager of San Francisco district, and J. B. Beyer, manager of St. Louis district. In each case the men appointed held similar positions with the former Republic Iron & Steel Co. organization.

* * *

George Watson, who resigned as sales manager of Wickwire Spencer Steel Corp., New York, May 15, has been appointed general sales manager in charge of sales and publicity, of the Welding Engineering & Research Corp., New York. After graduating from Sheffield Scientific school of Yale university with a B. S. degree he became affiliated with the Spencer Wire Co. mills. He soon was transferred to the sales department and later had charge of flat wire sales. Another promotion placed him in charge of all wire sales, and when in 1916 the Spencer Wire Co. became part of the Wickwire-Spencer Steel Corp. he was made assistant sales manager and later sales manager. His temporary address with the Welding Engineering & Research Corp. is 30 Church street, New York, but as soon as new laboratories are completed in Long Island City, N. Y., he will transfer his office there.

Washington Coal Passes to Frick Interests

Pittsburgh, June 17.—Sale of the Washington Coal & Coke Co. to the H. C. Frick Coke Co. has been confirmed. Consideration is said to have been $3,000,000.

The sale includes 1500 acres of coal, and 2000 acres of virgin land in addition to about 600 houses, 800 beehive coke ovens, and all machinery of the Washington company at Star Junction, Pa. Main offices of the Washington company are at Dawson, Pa.

Oven operations of the Washington Coal & Coke Co. will be discontinued. Coal properties will be worked in conjunction with adjoining Frick mines, the coal to be moved to the Monongahela river for shipment to Clairton, Pa.

Howard Foundries Inc., Chicago, has increased its directorate from seven to nine.

German Steel Wages and Prices Cut

Reduction of 7½ Per Cent for Ruhr Workers Made Effective by Minister of Labor—Markets Stagnant—Sharper Competition Developing

European Headquarters,
IRON TRADE REVIEW,
Caxton House, Westminster, S. W.1

LONDON, June 17.—(*By Cable*)—Wages of German iron and steelworkers in the Ruhr district have been reduced 7½ per ceent, effective within one month. The first suggestion of the steel companies was for 10 per cent. The order has been made binding by the minister of labor, thus recognizing its economic necessity. The companies do not benefit directly from the reduction as the saving is to be passed immediately to the public in the form of lower prices. Markets in Germany, France and Belgium continues stagnant. Competition may force further revision of wages.

Production of pig iron in Great Britain amounted to 614,500 tons in May, compared with 619,600 tons in April, and 654,800 tons in May, 1929. The number of stacks in blast June 1 was 141, a net loss of ten in a month. Steel output in May was 692,800 tons, against 696,100 tons in April, and 840,400 tons in May, 1929.

Whitsun holidays have further emphasized the curtailment of British business. Pig iron stocks are increasing except in Derbyshire where there is a good demand from pipemakers. Belgian iron bars are offered at £3 ($14.58) below the British delivered price.

The British steel market is lifeless, with moderate demand for rails the only exception. Tin plate is weaker due to the drop in tin prices. Manufacturers are well booked for the second half. Demand for galvanized sheets is quiet.

British iron and steel imports in May totaled 233,725 tons, compared with 234,806 tons in April, and 257,256 tons in May, 1929. May exports amounted to 294,729 tons. In April exports were 267,995 tons, and in May, 1929, 442,775 tons.

Some Small Gains in British Steel Market

LONDON, June 7.—(*European Staff Service*)—The British iron and steel export market shows slightly better tone although trade generally still is dull. All business appears to have been for small parcels for early delivery, and orders have been taken under keen competition. However, the atmosphere of the market for finished steel is slightly more hopeful. There have been a few transactions in continental material, but the volume is small. Some sales of Middlesbrough foundry pig iron and hematite pig iron have been made but these also have been limited to small tonnages. Prices ruling are those prevailing for some time.

In the engineering department, Dorman, Long & Co. Ltd., have obtained a contract from Egypt for construction of a swing bridge, and a building to house electrical storage plant; Davies Bros. & Co. Ltd., Wolverhampton, have obtained an order for galvanized steel intake screens for New Zealand; the Metropolitan-Cammell Carriage, Wagon & Finance Co. Ltd. has secured an order for nine passenger cars, two restaurant cars, and 11 underframes and bogies for the Tanganyika railways, and 200 freight cars and electrical equipment for saloon coaches for the Kenya and Uganda railways; Sir W. G. Armstrong, Whitworth & Co. Ltd., Newcastle-on-Tyne, have received an order for six mixed traffic locomotives and tenders for the Buenos Aires Western Railway, and

Current Iron and Steel Prices of Europe

Dollars at Rates of Exchange, June 16	*British* Gross Tons U. K. Ports		*French* Metric Tons Channel Ports		*Belgium and Luxemburg* Metric Tons Channel Ports		*German* Metric Tons Rotterdam or North Sea Port	
Export Prices f. o. b. Ship at Port of Dispatch—By Cable		£ s d		£ s d		£ s d		£ s d
PIG IRON								
Foundry No. 3, Silicon 2.50-3.00	$16.40	3 7 6*	$16.28	3 7 0	$16.28	3 7 0	$16.28	3 7 0
Basic-Bessemer	15.92	3 5 6	15.07	3 2 0	15.07	3 2 0	15.80	3 5 0
Hematite, Phosphorus 0.02-0.05	17.98	3 14 0	24.69	630*	.....	.....	17.74	3 13 0
SEMIFINISHED STEEL								
Billets	$29.77	6 2 6	$22.84	4 14 0	$22.84	4 14 0	$22.60	4 13 0
Wire rods	41.31	8 10 0	30.38	6 5 0	30.38	6 5 0	30.38	6 5 0
FINISHED STEEL								
Standard rails	$40.10	8 5 0	$31.59	6 10 0	$31.59	6 10 0	$31.59	6 10 0
Merchant bars	1.74c	8 0 0	1.18c	5 7 6	1.18c	5 7 6	1.18c	5 7 0
Structural shapes	1.68c	7 15 0	1.12c	5 1 6	1.12c	5 1 6	1.12c	5 1 6
Plates, ship, bridge and tank	1.79c	8 5 0	1.44c	6 10 6	1.44c	6 10 6	1.49c	6 15 0
Sheets, black, 24 gage	2.17c	10 0 0	2.15c	9 15 0	2.15c	9 15 0	2.33c	10 12 0
Sheets, galvanized, 24 gage, corrugated	2.47c	11 7 6	2.52c	11 8 9	2.52c	11 8 9	2.97c	13 10 0
Bands and strips	2.17c	10 0 0	1.29c	5 17 6	1.29c	5 17 6	1.29c	5 17 6
Plain wire, base	2.06c	9 10 0	1.46c	6 12 6	1.46c	6 12 6	1.46c	6 12 6
Galvanized wire, base	3.04c	14 0 0	1.76c	8 0 0	1.76c	8 0 0	1.76c	8 0 0
Wire nails, base	2.39c	11 0 0	1.46c	6 12 6	1.46c	6 12 6	1.54c	7 0 0
Tin plate, base box 108 pounds	$ 4.43	0 18 3	.....	.....	.....	.....	$ 8.99	1 17 0

*Francs

Domestic Prices at Works or Furnace—Last Reported			Francs			Francs		Marks
Foundry No. 3 Pig Iron, Silicon 2.50-3.00	$16.40	3 7 6	$19.26	490(2)	$17.30	620	$20.28	85
Basic pig iron	15.92	3 5 6	20.63	525(1)	15.07	540	21.71	91
Furnace coke	3.40	0 14 0	6.60	168	6.00	215	5.13	21.50
Billets	29.77	6 2 6	24.36	620	22.60	810	28.87	121
Standard rails	1.79c	8 5 0	1.46c	810	1.62c	1,245	1.51c	140
Merchant bars	1.74c	8 0 0	1.22c	680	1.25c	965	1.52c	141
Shapes	1.84c	8 10 0	1.26c	700	1.22c	940	1.49c	138
Plates, ship, bridge and tank	1.95c	9 0 0	1.46c	810	1.52c	1,170	1.71c	158
Sheets, black, 24-gage	2.28c	10 10 0	2.72c	1,510	2.60c	2,000	1.40c	130
Sheets, galvanized 24 gage, corrugated	2.58c	11 17 6	3.52c	1,955	3.06c	2,300	3.78c	350
Plain wire	2.06c	9 10 0	2.03c	1,125	2.15c	1,650	2.43c	225
Bands and Strips	2.17c	10 0 0	1.39c	770	1.50c	1,150	1.77c	164

*Middlesbrough; †Basic; ‡delivered; (1) Basic-bessemer; (2) Longwy. British export furnace coke £0 14s 0d ($3.40) f. o. b. Ferromanganese £19 6s 0d ($93.80) delivered Atlantic seaboard, duty-paid. German ferromanganese £15 0s 0d ($72.90) f. o. b.

The equivalent prices in American currency are in dollars per ton for pig iron, coke, semi-finished steel and rails; finished steel is quoted in cents per pound and tin plate in dollars per box. British quotations are for basic open-hearth steel; French, Belgian, Luxemburg, and German are for basic-bessemer steel.

six locomotives and tenders for the Ceylon government; the North British Locomotive Co. Ltd., Glasgow, has received a contract for four tank locomotives for use on the Huelva properties of the Tharsis Sulphur & Copper Co. Ltd., in Spain; Robert Stephenson & Co. Ltd., Darlington, have obtained a contract for 15 locomotives for the Buenos Aires Pacific Railway; Beecroft & Partners Ltd., Sheffield, have secured a contract for a steel foundry in Egypt; Samuel Fox & Co. Ltd., Sheffield, have booked an order for steel tires for the Egyptian State Railways; Workman, Clark & Co. Ltd. have obtained an order for a 25,000-ton whaling factory ship for Norway, and Yarrow & Co. Ltd., Glasgow, have taken an order for two boilers, each of 75,000 pounds capacity, for Finland.

Reports from the continent indicate that iron and steel export trade is in a lethargic condition, and keen competition and price-cutting exists for any products not syndicated. Even for syndicated products it is reported that orders are taken at prices below the level fixed by the comptoirs, although these infractions are difficult to trace. Most continental works, with the exception of France, are slack.

Can Sell Steel Only on Cut Prices

Brussels, June 6.—(*European Staff Service*)—The Belgian iron and steel market is at a standstill, and no serious business is transacted. The situation is becoming alarming, as unemployment is feared.

Prices for steel are those fixed by the entente, but numerous violations are reported, and it is said that orders can be booked only if rebates are granted. Many meetings were held last week to organize the British market for sales of semifinished products and merchant bars. It had been decided that no intermediary would be accepted for the sale of semifinished products, that the various works would have to sell direct to British transformers through their agents, and that those agents would have to be grouped and work in cooperation. It seemed that everything was in order, but at the meeting May 31 demands of a certain works were so extravagant that the decision already taken had to be annulled. This incident is serious, as it will render almost impossible the organization of the comptoir.

With regard to sales of merchant bars, the works agreed to group the British merchants in the same way as was done for continental exporters, with this difference, that British merchants will be obliged to buy all continental steel through the member-works of the entente, but they retain the liberty to purchase steel in England as at the present time. They will benefit by the same rebates as the continental buyers of the different classes. Merchants belonging to Class A buyers will then have 2s (48.00c) rebate.

German Trade Declines

Berlin, June 6.—(*European Staff Service*)—A drop in exports of iron and steel from Germany was registered during April, exports of pig iron, ferro-alloys and other iron and steel products. Among the principal items exported were: bars, shapes, hoops and bands, 108,352 tons; black plates and sheets, 43,950 tons; semifinished steel products, 40,840 tons; wire rod and wire, 31,409 tons; various forgings, 23,155 tons; railroad track material, 22,660 tons; forged tubes, 22,327 tons. The tonnage of scrap exported was 23,920 metric tons.

Imports of pig iron and ferroalloys into Germany also were low in April, but imports of other iron and steel products increased. The April imports consisted mostly of merchant bars, sections, hoops and bands, of which 56,382 tons were imported. The tonnage of scrap imported amounted to 10,806 metric tons. Comparisons follow, in metric tons:

	—IMPORTS—		—EXPORTS—	
Mon. ave.	Pig iron and ferro-alloys	Other iron and steel	Pig iron and ferro-alloys	Other iron and steel
1927	23,895	217,505	29,910	347,645
1928	25,535	174,250	24,585	394,575
1929	14,765	137,435	36,115	448,330
1930				
Jan.	22,004	105,127	33,153	488,245
Feb.	13,597	98,397	24,271	409,822
March	16,777	107,401	25,983	465,166
April	12,032	113,195	18,364	405,633

Luxemburg Output Low

Brussels, June 7.—(*European Staff Service*)—A marked reduction in the output of pig iron and steel was registered in Luxemburg for April. The April output is the lowest since February, 1929.

The output of steel ingots and castings in April was the lowest since February, 1927; it included 197,609 tons of basic bessemer, 522 tons of open-hearth and 119 tons of electric steel. Comparisons follow, in metric tons.

Mon. ave.	Furnaces on last day	Pig Iron	Steel ingots and castings
1913	....	212,320	111,355
1927	39	227,710	200,595
1928	38	230,840	214,315
1929	37	242,175	225,605
1930			
Jan.	37	249,875	216,315
Feb.	36	231,326	214,857
March	35	248,983	225,285
April	32	221,209	198,250

German Production Is Lowest for Years

Berlin, June 7.—(*European Staff Service*)—A further reduction in the output of iron and steel in Germany was registered during April, the April figure being the lowest since December, 1928, at the end of the Ruhr strikes. Previous to that abnormal period, one has to go back to September, 1926, before finding such a low figure of production. The output for April this year was composed of 552,929 tons of basic bessemer, 194,379 tons of ferro-alloys, 94,657 tons of foundry, 58,422 tons of hematite, 550 tons of direct castings and 421 tons of gray forge pig iron.

The output of steel ingots and castings in April, leaving out the abnormal period at the end of 1928, was the lowest since July, 1926. The April output was composed of 1,012,545 tons of ingots and 20,838 tons of steel castings. The ingot output included 538,502 tons of basic open-hearth, 452,647 tons of basic bessemer, 10,102 tons of acid open-hearth, 8708 tons of crucible and electric steel and 2586 tons of ingot iron.

The production of finished steel in April was the lowest since that of February, 1926. Comparative figures follow, in metric tons:

Mon. ave.	Furnaces on last day	Pig iron	Steel ingots and castings	Finished steel
1913*	.....	909,640	993,640	970,240
1927	116†	1,091,875	1,359,225	1,069,930
1928	101†	984,700	1,209,770	880,690
1929	95†	1,116,730	1,353,820	940,425
1930				
Jan.	95	1,092,206	1,275,023	896,076
Feb.	93	964,517	1,176,435	797,899
March	92	1,007,576	1,201,206	834,349
April	90	901,358	1,033,383	737,355

*Present boundaries.
†Last day of year.

French Trade Falls Off

Paris, June 7.—(*European Staff Service*)—Exports of pig iron and steel from France in March were below those of February. For first quarter, exports of pig iron totaled 131,515 metric tons. Exports of other iron and steel, including scrap, during first quarter were 826,793 metric tons. Steel exported during the first three months of the year amounted to 82,931 metric tons.

For the first three months, imports of pig iron totaled 49,016 metric tons. Imports of other iron and steel products during first quarter were 75,363 metric tons and of iron and steel scrap 8499 metric tons.

As modifications have been made in the compilation of foreign trade figures in France, this year's figures are not comparable with those of previous years.

	IMPORTS		EXPORTS	
Mon. ave.	Pig iron	Other iron and steel products	Pig iron	Other iron and steel products
1927	3,230	7,440	69,640	404,730
1928	3,365	8,320	52,215	368,410
1929	3,345	15,100	46,760	279,610
1930				
Jan.	11,806	22,374	44,016	259,133
Feb.	20,463	24,965	44,977	297,208
March	16,747	28,024	42,522	269,752

British Export Prices

London, June 7.—(*European Staff Service*)—Board of trade returns for April, 1930, give the average British export prices per gross ton for a certain number of iron and steel products. These prices are compiled from actual contracts which were made several months ago, and this accounts for the difference between these quotations and the base prices regularly quoted in our columns.

Compared with those of the preceding month, prices in April were higher for all products except plates and black sheets. In comparison with those of a year before, prices were higher for foundry pig iron, beams and tin plates, but lower for rails, plates, black sheets and galvanized sheets.

BRITISH EXPORT PRICES

	£	s	d	$
Foundry pig iron	4	4	6	20.56
Beams	9	6	11	45.48
Rails	8	13	10	42.30
Plates	9	7	4	45.58
Black sheets	11	18	10	58.11
Galvanized sheets	14	3	8	69.02
Tin plates	20	5	5	98.64

CONSTRUCTION and ENTERPRISE

Concise, Timely Business Building Opportunities from Field of Industry

East

Central

CHICAGO—Commonwealth Edison Co., T. S. Thomas, architect, 72 West Adams street, has building permit for alterations to substation at 125 North Desplaines street to cost about $7000.

MOLINE, ILL.—J. J. Normoyle Co. plant, Fourth and Thirtieth avenues, experienced fire damage to property and machinery recently amounting to about $50,000. Company is manfacturer of plant supplies, tool and motors. Advice states plant will be rebuilt.

WAUKEGAN, ILL.—Shur-Hit Mfg. Co., manufacturer of stampings and automotive parts, has taken industrial space in the Manufacturers' Terminal building here and is now installing machinery for beginning operations about July 1 when approximately 50 people will be employed.

MARION, IND.—Bowman Construction Co. holds a contract for building a 100 x 300-foot manufacturing plant for the U. S. Radio Co., on South Adams street, to cost over $45,000.

SOUTH BEND, IND.—Notre Dame university plans engineering building at approximate cost of $450,000, although engineer and architect have not been selected.

TERRE HAUTE, IND.—Quick Welding & Machine Co., which is now installing machine shop equipment, advises it is opening a new automobile body department. (Noted June 12.)

DETROIT—Board of education, 1354 Broadway, proposes equipping 3-story Pershing high school addition with manual training equipment. Smith, Hinchman & Grylls, 800 Marquette building, are expected to receive bids early in July.

JACKSON, MICH.—Wire & Wood Wheel Corp., recently incorporated with $25,000 capital by O. W. Mott and H. J. Smith, will begin production soon of special small wheels.

KALAMAZOO, MICH.—Ramisch Tool & Die Co., Reed street, is having a 1-story, 58 x 100-foot plant built on East Kalamazoo avenue by Vandeberg & Son, 234 East Patterson street. Carl T. Ramisch is owner of the former company.

LANSING, MICH.—Atlas Drop Forge Co., Earl W. Goodnow president, recently announced an expansion program. Unit being constructed will be 80 x 111 feet and excavations and foundations have already been completed. Unit will house new board hammers replacing smaller hammers. Company advises it is purchasing one 16,000-pound steam hammer; four 2500-pound board hammers; two 2000-pound board hammers.

MUSKEGON, MICH.—Brunswick Radio Corp. will erect a manufacturing plant for the production of radios and accessories here, said to cost approximately $500,000. Corporation has two plant units under construction in addition to proposed structure.

PORT HURON, MICH.—Mueller Brass Co., manufacturer of metal products is said to plan enlargement of plant, following recent settlement of a suit in favor of the Mueller company over a patented pipe fitting.

SAGINAW, MICH.—Saginaw Stamping & Tool Co., Alex R. Pribil president, is building a plant addition, 100 x 250 feet. Company reports large orders booked.

BUCYRUS, O.—Carroll Foundry & Machine Co. plant building was razed preparatory to erection of a modern plant building for the Sozonian Burial Vault Co., C. F. Michael president. Latter company advises plant, 60 x 290 feet is being erected, contracts having been let locally. Machinery needs have largely been cared for.

CANTON, O.—Prest-O-Lite Co. Inc., 30 East Forty-second street, New York, manufacturer of burners, torches, tanks, and batteries, will build a 1-story acetylene producing plant here on Seventeenth street. Estimated cost $50,000. Plans are private.

CINCINNATI—National Metal Industries Inc.,

(*Continued on Page* 115)

Resale Equipment News

MACHINERY, equipment, supplies, corporate franchise, goodwill, land and buildings of the Elliott-Blair Steel Co., New Castle and Mercer, Pa., will be sold at auction by the receivers June 27. Inventory of assets totals $400,000. The plants will be sold preferably as a whole, though sale of parts will be considered. Equipment includes rolling mills, shears, coilers, slitters and motors.

* * *

Machinery, equipment and tools of the Banting Mfg.. Co., 2401 Dorr street, Toledo, O., will be sold at public auction June 25. The equipment includes lathes, shapers, planers, boring mills, radial drills, drills, saws, milling machines, compressors and electric motors. Sale will be in parts and the plant will not be offered as a whole.

* * *

Entire assets of the Fulton Pit Car Co., Canal Fulton, O., will be sold at public auction June 24, piece by piece, and not as a whole. Sale will cover land and buildings, machinery and equipment, steel and supplies.

* * *

Briggs & Turivas Inc., Blue Island, Ill., has bought the abandoned steel and pipe coupling plant of the Youngstown Sheet & Tube Co. at Zanesville, O., originally the plant of the Mark Mfg. Co. The plant probably will be dismantled and the material sold.

* * *

Equipment, machinery and real estate of the H. G. Trout Co., 226 Ohio street, Buffalo, manufacturer of propeller wheels and marine steam engines, will be sold at auction in liquidation July 8 and 9, by Samuel T. Freeman & Co., auctioneers. The site contains a foundry 50 x 231 feet, a machine shop 50 x 322 feet, a 2-story erecting room, blacksmith shop, 39 x 48 feet and an office building 36 x 96 feet. The equipment includes boring mills and planers, drills, shapers, slotters, keyseaters, lathes, millers, saws, hammers, cranes, compressors and other machinery.

Sales Calendar

June 24—*Auction sale of assets of Fulton Pit Car Co., Canal Dover, O.*

June 25—*Auction sale of machinery and equipment of Banting Mfg. Co., Toledo, O.*

June 27—*Receivers' sale of entire assets of Elliott-Blair Steel Co., New Castle and Mercer, Pa.*

July 8-9—*Liquidation auction sale of real estate, machinery and equipment of H. G. Trout Co., Buffalo.*

Machinery

Railroad Buying Fails to Fill the Gap in Restricted Purchases by Industrial Interests—Price Advance Rumors Heard

WITH the sales of machine tools and shop equipment decidedly slow, machinery manufacturers and distributors are entering into what appears to be a decidedly backward market for the next two months. No large lists have been placed and no large lists are pending, the bulk of the going business being small purchases of one and two tools at a time. Railroads had been looked to in filling the gap imposed by restricted industrial activity, but this business has not materialized. Further, the carriers have issued practically no inquiries. Prices remain unchanged except on one line of lathes on which quotations have been increased 10 per cent effective July 1. In most cases machine tool makers have reduced operations materially.

New York, June 17.—Outside of moderate inquiry for navy yard and arsenal equipment, machine tool buying is at a low ebb. Sales to industrial interests are confined to one or two tools at a time, mostly for replacement, but these orders are few. For the government arsenal at Dover, N. J., bids are being taken on two lathes, a press, milling machine and several other tools. Five engine lathes are up for the Brooklyn navy yard and other nearby points, also a drill. Two engine lathes as well as a miller and a precision bench lathe will be bought for Norfolk, Va., yards. A double action cam press has been placed with a Brooklyn builder.

Railroad buying continues a disappointment to machine tool builders. With several of the most active buyers out of the market, sellers had looked to the railroads to assist in filling the gap, but this business has failed to materialize.

The general industrial situation remains spotty. Bearing makers are taking an uneven spread of business. One or two interests in Connecticut are fairly busy, but the condition is not general.

Prices are unchanged and delivery is normal on standard tools. Some builders have stocked a few machines, but not heavily. Grinding equipment also is dull, inquiry and buying having slumped. Export business is off. The large list of the Amtorg interests for Russia is still pending, although it is reported several of the Amtorg representatives have been recalled to Russia and replaced with new men. Indications are that some of this business will be placed within a month.

Worcester, Mass., June 17.—Machinery operations are on a low basis. There is a sprinkling of inquiry throughout New England for single units but few orders result. Little hope exists for any upward trend in the market during the next few months. Grinders are slow. Textiles are weak. The Thorndike mills at West Warren are being offered for sale, giving some apprehension that the woolen department may soon close down. Definite decision on that has not been made.

Chicago, June 17.—Machine tool houses that participated in the few large lists of last month find June sales decidedly slow by contrast, while others report slightly heavier totals than in May. One builder of lathes has advanced prices on several sizes 10 per cent, effective July 1, while rumors of other advances are heard. Probably less potential inquiry is before the market than for two years, and the next 60 days are expected to be slow. No heavy buying is expected from the implement and tractor works. Buying of the Caterpillar Tractor Co., Peoria, Ill., will be confined to a small list of tools. Specialty equipment moved fairly well during the week, and a few small railroad orders were placed, including a bushing press by Chicago & North Western. Chicago board of education has ordered a single-spindle drill and a 16-inch shaper for the Washburn continuation school. Nearly a dozen receivership auctions of used tools have been held in the district during the last few weeks, but mostly in light equipment which has been moved with little difficulty from floors of dealer purchasers.

Pittsburgh, June 17.—Machine tool demand is slightly more active with the general outlook improved moderately by the closing on several tools that had been pending for some time. Sales still are seasonally light, but inquiry is fairly well maintained and a sizable volume of business remains pending. The market still lacks large lists in new inquiry while awards also are limited to a few tools at a time. Demand from railroads continue disappointing with expected inquiries lacking from leading interests.

Cleveland, June 17.—Activity in this district is slow, both as regards manufacturers and dealers. Tool building plants are operating on reduced schedules just sufficient to meet demands of shipment. There has been a disposition to keep working forces as nearly as complete as possible to afford employment to the maximum number and to eliminate the confusion when operations are accelerated. Sales are scattered and individual machines predominate. Inquiries are scarce.

Crane Shipments Decline

New York, June 17.—Shipments, new orders and unfilled orders of overhead cranes declined in May, as compared with the previous month, according to the Electric Overhead Crane institute. New orders totaled 100 units, with a tonnage capacity of 1508½ tons, valued at $879,942.31. This compares with the 106 units, tonnage capacity 1317½, valued at $825,326.50 in April.

New orders in May included 72 units, tonnage capacity 1239, valued at $595,855. In April new orders totaled 83 units, tonnage capacity 1760½, valued at $882,358.81.

Unfilled orders on June 1 were 263 units, with a tonnage capacity of 5754, valued at $3,490,074.18. On May 1 unfilled orders were 286 units, tonnage capacity 6131½, valued at $3,739,336.99.

Cast Pipe for Tunnel

New York, June 17.—Cast iron pipe seven feet in diameter under the water and nine feet in diameter at both ends, will carry 150,000 telephone circuits or 300,000 single copper wires under the Harlem river for the New York Telephone Co., work to be started soon.

The pipe will be one of the largest ever cast. The tunnel will run from Second avenue and 129th street, Manhattan, to Lincoln avenue, Bronx, suspended on piles 27 feet below mean low water mark. Manholes will be 16 feet below the streets at both ends. The entire tunnel will be encased in concrete and will contain 148 clay ducts.

Australian Foundry Joins Gray Iron Group

International affiliations of the Gray Iron institute have recently been expanded by the addition of foundries in Australia and Porto Rico to membership. The new companies, who with the Canadian organizations represent the member foundries outside of the United States, are T. Main & Sons Pty. Ltd., East Melbourne, Victoria, Australia, and the Porto Rico Iron Works Inc., Ponce, Porto Rico. Recent additions to the domestic membership of the institute are as follows: J. H. Hodes, junior vice president, Prier Brass Mfg. Co., Kansas City Mo.; Ellis Rogers, vice president, Rogers Iron Works Co., Joplin, Mo.; H. B. Hanley, American Laundry Machinery Co., Rochester, N. Y.; and W. B. Wood, Gra-Iron Foundry Corp., Marshalltown, Iowa.

Construction and Enterprise

(*Continued from Page* 113)

recently incorporated with 1500 shares no par stock, advises that it has plant located at 1115 Marshall avenue. Corporation was formed to manufacture and deal in machinery and appliances, including carrying on the business of a foundry, pattern and machine shop. William C. Grueneberg is president.

CLEVELAND—Harshaw Chemical Co., 1945 East Ninety-seventh street, will add to its laboratory at the above address, and construct a foundry building, 86 x 130 feet, on Newburg avenue. Mark Swisher, 5927 Euclid avenue, industrial engineer, has contracts.

CRESTLINE, O.—Schill Bros. Stove & Furnace Co., S. P. Hayes, contemplates building a 1-story foundry on Mansfield street at a reported cost of $40,000 to partly replace fire loss. (Noted March 6.)

EAST LIVERPOOL, O.—Patterson Foundry & Machine Co. advises through Richard L. Cawood that it will completely replace all machinery now being removed from the old No. 1 plant of the Homer Laughlin China Co., for the newly formed Patterson Refractories Co., its subsidiary. Plant building is 240 x 250 feet. (Noted June 12.)

IRONTON, O.—Chaffin Mfg. Co., A. G. Howards president, recently organized, will install machinery in its plant on Lawrence street, for the manufacture of carburetors. Production will begin in a few weeks.

TOLEDO, O.—Toledo Pressed Steel Co., 397 Phillips avenue, is adding to its manufacturing space and has increased its equipment with the addition of two presses.

BONCAR, W. VA.—Electro Metallurgical Co. of America, 30 East Forty-second street, New York, will construct a large steam power plant here.

MAYVILLE, WIS.—Wisconsin Radiator Furniture Co. advises that Rohde-Kapelle Co. is the contractor for its new plant addition. Main building is 48 x 175 feet, the second unit 36 x 50 feet. No new machinery will be required. (Noted June 12.)

MILWAUKEE—Milwaukee Valve Co., 139 Burrell street, has awarded general contract to Ed Steigerwald & Sons, State and Fifty-third streets, for alterations and small additions to plant. John Fraser Jr. is president.

MILWAUKEE—A. J. Petelinz, architect, 192 Fourth street, is drawing plans for a 3-story industrial and pathological research building for an undisclosed owner. Unit will be 100 x 250 feet and will cost approximately $150,000.

SHEBOYGAN, WIS.—Garton Toy Co. has awarded contract for 4-story, 109 x 218-foot manufacturing plant to M. Deny. Company will add all-steel construction of toy airplanes and automobiles.

WEST ALLIS, WIS.—J. F. Devine Pattern & Mfg. Co., 535 Fifty-sixth avenue, has awarded contracts for the erection of a shop addition.

North Atlantic

WINSTED, CONN.—Winsted Insulated Wire Co. will erect a plant addition and expects to purchase wire-drawing machinery.

BALTIMORE—Hinde & Dauche Paper Co., Sandusky, O., advises it will erect a 30 x 40-foot power house here in connection with a proposed 1-story paper mill. (Noted June 12.)

BALTIMORE—A. J. Sackett & Sons Co., Eastbourne and Highland avenues, manufacturer of fertilizer machinery, will build a shop, contract for which has been let to Maryland Steel Products Co., Standard Oil building.

BOSTON—American Locker Co., Wabash boulevard, Pittsburgh, manufacturer, is reported having recently moved operations here.

BROOKLINE, MASS.—Edison Electric Illuminating Co., 39 Bolyston street, Boston, plans construction of a power substation here on Beaconsfield road, at an estimated cost of $50,000.

LAKEHURST, N. J.—Bureau of yards and docks, navy department, Washington, contemplates extension to mechanical shop at naval air station here, among additions proposed to other units. Cost is estimated at $150,000 including equipment.

BROOKLYN, N. Y.—Plant of the Standard Lighting Fixture Co., 85 Flatbush avenue, was recently damaged by fire. Company manufactures gas and electric fixtures.

BUFFALO—Buffalo General Electric Co., Electric building, plans construction of a power substation, said to cost $65,000.

BUFFALO—Charles A. Branston Inc., 297 Washington street, manufacturer of surgical instruments, has leased space in a building at Ellicott and Mohawk streets, for the manufacture of electrical surgical appliances upon installation of new equipment.

PLEASANTVILLE, N. Y.—Westchester Lighting Co., First avenue, Mount Vernon, N. Y., will build a power substation and automobile repair building here at cost of about $160,000.

RIDGEWOOD, N. Y.—Brooklyn & Queens Transit Corp., H. J. Kolb engineer, 385 Flatbush avenue, Brooklyn, N. Y., plans addition and alteration to 1-story shop at 1801 DeKalb avenue.

SYRACUSE, N. Y.—Union Carbide & Carbon Corp., 30 East Forty-second street, New York, has purchased a 7-acre tract here for the erection of a plant for its subsidiary, the Prest-O-Lite Co. Inc., which will afford employment for over 100 men.

ERIE, PA.—Erie Enameling Co., 1306 West Twentieth street, will erect a 1-story, 60 x 120-foot plant and has awarded contracts.

ERIE, PA.—Penn Brass & Copper Co. has awarded contract for installation of two annealing furnaces to Ryan, Scully & Co., 3711 Wissahickon avenue, Philadelphia.

GROVE CITY, PA.—Cooper-Bessemer Corp., B. B. Williams president, manufacturer of engines, has announced an expansion of plant facilities here and at Mount Vernon, O. Equipment to cost over $250,000 will be installed.

LANCASTER, PA.—Plant of the Lancaster Pipe Mounting Co. was recently damaged by explosion and fire. Company manufactures pipe mountings, among other products.

MERCERSBURG, PA.—Generating plant of the Mercersburg, Lemasters & Markes Electric Co., at Markes, Pa., near here, W. Stroup superintendent, was recently damaged by fire. Estimated loss $50,000. Company plans to rebuild.

NORRISTOWN, PA.—Wildman Mfg. Co., F. B. Wildman president, manufacturer of knitting machinery, has awarded contract to the Austin Co., Cleveland, for a 100 x 200-foot plant addition costing approximately $100,000. (Noted March 27.)

PHILADELPHIA—Smith, Hardican Co., 1811 Callowhill street, builder, has contract to build a $20,000 shop at Forty-second and Sansom, 48 x 100 feet, according to advice.

Southern States

COLUMBUS, GA.—Town, H. B. Crawford manager, will receive bids until June 30 for boiler house and equipment in connection with the building of a hospital here. T. F. Lockwood, Murray building, is architect.

PADUCAH, KY.—Plant of National Sheet Metal Works, 123 South First street, recently was reported damaged by fire.

RICHMOND, KY.—Board of regents, Eastern Kentucky State Teachers college, closes bids June 21 for alterations and improvements to boiler and power plant, including installation of equipment.

COLUMBIA, S. C.—B. M. Sawyer, chief commissioner, state highway department, closed bids June 16 for repair, maintenance and blacksmith shops at Abbeville, Greenwood, Winnsboro, Sumter and Camden, S. C.

JACKSON, TENN.—Mobile & Ohio railroad, D. L. Rice superintendent, Jackson division, will build a plant for the reclamation of iron and steel scrap on the site of its old shop property. Estimated cost, $25,000.

LEWISBURG, TENN.—Lewisburg Stove Foundry is reported to have suffered fire damage in molding room recently. Loss to machinery and patterns, $10,000.

HOUSTON, TEX.—Southern Brass Mfg. & Plating Co., 6614 Harrisburg boulevard, has let contract to D. M. Dickey for building a warehouse at an estimated cost of $10,000.

SAN ANTONIO, TEX.—Air Corps, Randolph field, receives bids June 27 for large airport

construction project, included in which will be a shop building to cost about $200,000.

SHAMROCK, TEX.—Panhandle Power & Light Co., Amarillo, Tex., will build a large power plant here, plans for which are reported held by O. P. Clark, engineer, 4429 Scarritt avenue, Kansas City, Mo. Estimated cost, over $3,000,000.

West Central

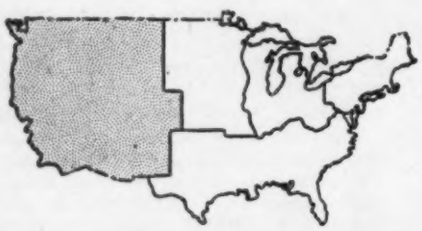
WICHITA, KANS.—Stearman Aircraft Co., subsidiary of the United Aircraft & Transport Co., will erect a large manufacturing plant at airport here for the production of airplanes. Two-story administration building will be built in addition. Cost, including equipment is estimated at $1,000,000. Contract has been let to the Austin Co., Cleveland.

FAIRMONT, MINN.—Fairmont Railway Motors Inc., manufacturer of cars, wheels, railway and car motors, will build a 1-story, 150 x 800-foot manufacturing plant and has plans through Frank D. Chase Inc., engineer, 720 North Michigan avenue, Chicago.

KANSAS CITY, MO.—Vulcan Mfg. Co., 1511 Cypress street, Sidney S. Holland president, has leased a 3-story building on Wyandotte street which will be remodeled. Company manufactures washing machinery.

ST. LOUIS—Superior Structural Steel Co., 5100 Farlin avenue, will erect a 1-story, 70 x 140-foot plant at an estimated cost of $12,000. Plans are private.

HASTINGS, NEBR.—Debus Mfg. Co., manufacturer of steel shipping boxes, North Colorado avenue, proposes to rebuild plant recently damaged by tornado. Cost will be about $50,000. N. J. Taylor is one of the company officers.



Western States

EMERYVILLE, CALIF.—American Tractor Equipment Co. has awarded contract to Austin Co., engineers and builders, Cleveland, for a 90 x 100-foot plant to be used in the welding and assembly of tractor equipment. A 3-ton traveling bridge crane will be installed. Estimated cost, $40,000.

ESCONDIDO, CALIF.—One-story vocational training shop, 50 x 175 feet, will be built for the board of education here and plans are held by T. C. Kister & Co., architects, Architect's building.

LOS ANGELES—Stephens-Adamson Mfg. Co., 2227 East Thirty-seventh street, manufacturer of conveying and screening equipment, plans a 2-story plant, which with equipment, will cost about $40,000. Hamm, Grant & Bruner Inc., 307 South Hill street, is engineer. Stephens-Adamson company home offices are in Aurora, Ill.

MONTEBELLO, CALIF.—Carbon Products Co., 2357 East Slauson street, Los Angeles, has started work on a plant here understood to cost $250,000. Twelve units will be constructed on a 4½-acre site. Company will employ approximately 150 men.

GLENDIVE, MONT.—Northern Pacific railroad, A. W. Coleman agent, Grand Forks, N. D., has awarded contract to Carl G. Steen, Grand Forks, N. D., for a 1-story machine shop addition. Reported cost, $100,000. (Noted June 5.)

HAVRE, MONT.—Warehouses owned by H. Earl Clack Co. Inc., dealer in grain, elevator supplies, fuel and oil and another occupied by the National Oil Co. were both recently damaged by fire. Loss was estimated at $75,000.

HOOD RIVER, OREG. — City has plans through Stevens & Koon, consulting engineers, Spalding building, Portland, Oreg., for a power plant and lighting system estimated to cost $50,000, bonds for which were recently voted.

PORTLAND, OREG.—Oregon Stages Inc., 352 Wamphill street, is receiving bids through Knighton & Howell, architects, United States National Bank building, for a 2-story, 200 x 240-foot service garage to include body, blacksmith and machine shops.

PORTLAND, OREG.—Crane Co., 160 North Fourteenth street, wholesaler of pipe fittings, brass fittings and plumbers' supplies, has awarded contract to Drake, Wyman & Voss, United States Bank building, for a 1-story, 100 x 200-foot warehouse to be built at Johnson and Irving streets at a cost of $45,000.

HOQUIAM, WASH.—George Wise has started construction of a mechanical repair shop and garage here. Building will be 50 x 110 feet, equipped to repair motor boat engines as well as automobiles and tractors.

PULLMAN, WASH.—Myers & Telander, contractors, Empire State building, Spokane, Wash., have contract for shop building construction for Washington State college here. Estimated cost, $40,000. (Noted May 29.)

SEATTLE—Austin Co. has completed plans for a plating shop addition to the plant of the Boeing Airplane Co., 330 West Front street.

SEATTLE—Northwest Washing Machine Co. has completed plans for a 1-story, 70 x 200-foot plant at 2012 Third avenue, estimated to cost $10,000.

Canada

PORT ARTHUR, ONT.—D. Bohm Ltd. is completing arrangements for erection of a $15,000 automobile repair plant here.

TORONTO, ONT.—Canadian Wire Bound Boxes Ltd., Gerrard street east, at a directors' meeting announced plans for the erection of a manufacturing plant here.

TORONTO, ONT.—Bids will be received until July 29 by Bert S. Wemp, mayor, for the supply and installation of two 24,000,000-gallon centrifugal pumps and two 10,000,000-gallon centrifugal pumps, with induction motors and control equipment, for the high level pumping station.

CHILLIWACK, B. C.—Broder Canning Co. Ltd., 12 Front street, New Westminster, B. C., will erect a canning plant here to cost $60,000 exclusive of machinery.

MONTREAL, QUE.—Robertson Lead Mfg. Co. Ltd., 6744 Hutchinson street, has purchased a site on Notre Dame street, where it proposes to erect a manufacturing plant.

MONTREAL, QUE.—In connection with the erection of a copper refinery here to cost $2,000,000 for the Canadian Copper Refiners, Durocher street, the steel contract has been let to Canadian Vickers Co. Ltd., Maisonneuve, Que. (Noted June 12.)

Recent Incorporations

CHICAGO—Champion Plating Works Inc. has been incorporated with $20,000 capital by Samuel G. Rautbord, 610 Cunard building, to manufacture and deal in machinery and appliances.

CHICAGO—Auto Parts & Gear Co. has been incorporated with $100,000 capital by Cook, Albert, Ferncase & Goldstein, 1 LaSalle Street building, to deal in auto parts and machinery.

CHICAGO—Dewalt Machinery Inc. has been incorporated with $20,000 and 100 no par shares by Beckman, Olson, Hough & Woods, 134 North LaSalle street, to deal in ma-

(*Concluded on Page* 118)

3 Years—*and* All's Well *on* Carnegie's 52″ Beam Mill

On and on go Timken Bearing Equipped rolling mills—up and up goes tonnage—down and down go costs.

For more than three years Timken Bearings of 12½″ bore x 25½″ O.D. have borne the brunt of daily service on the vertical roll necks of a 52″ beam mill in the plant of The Carnegie Steel Company.

This Timken accomplishment becomes all the more remarkable when the severity of the conditions under which it was consummated are considered, for the bearings have a capacity of 1,715,000 pounds at the regular mill speed of 100 r.p.m.

Here, as in all other rolling mill requirements, the exclusive combination of Timken tapered construction and Timken *POSITIVELY ALIGNED ROLLS* has proved itself master of the situation, freeing the rolls from friction's grip, taming torque, subduing shock and thrust and weight, cutting down power demands from 40 to 50%, keeping the steel coming through on schedule.

THE TIMKEN ROLLER BEARING CO.
C A N T O N, O H I O

TIMKEN *Tapered Roller* **BEARINGS**

Construction and Enterprise

(*Concluded from Page* 116)

chinery and hardware.

CHICAGO—John P. Moos Inc. has been incorporated with $40,000 capital by Charles Rudolph, 33 North LaSalle street, to deal in architectural and ornamental sheet metal.

CHICAGO—Diemakers' Tool Co. has been incorporated with $4200 capital by Jacob Rasmussen, 354 North Halsted street, to deal in tools, dies and special machinery.

SOMERVILLE, MASS.—New England Pipe & Supply Co. has been incorporated with $50,000 capital by Harry Lamport, Lowell, Mass., to engage in the business of manufacturing and dealing in plumbing, heating and lighting supplies and fixtures.

WEYMOUTH, MASS.—E. S. Tolmie & Co. Inc. has been incorporated with $25,000 capital by Edgar S. Tolmie and Thomas Knight, to carry on the business of manufacturing and dealing in machines and devices of all kinds.

ADRIAN, MICH.—Adrian Foundry & Machine Co. has been incorporated with 2000 no par shares to engage in a foundry and machine shop business.

DETROIT—J. C. Glenzer Co. has been incorporated with $50,000 capital by John C. Glenzer, 6463 Epworth boulevard, to buy and sell tools and machinery.

DETROIT—Colonial Tool Co. Ltd. has been incorporated with $50,000 capital by Otto Lundell, 147 Joseph Campau street, to engage in a general tool and machine shop business.

DETROIT—State Machinery Sales Co. has been incorporated with $25,000 capital by George H. Cox, 546 East Woodbridge street, to buy, sell and manufacture machinery, machine tools and power equipment.

DETROIT—Pyramid Bronze & Aluminum Co. has been incorporated with 1000 no par shares by William B. Rickston, 5861 Forsyth street, to manufacture and deal in bronze and aluminum products.

DETROIT—Mona-Forr Plane Corp. has been incorporated with 50,000 no par shares by George N. Monaghan, 2010 Washington boulevard building, to manufacture and sell aircraft and aircraft parts.

DETROIT—Engineering Industries Inc. has been incorporated with 26,000 no par shares by Herbert S. Norton, 700 Penobscot building, to manufacture and deal in fuel savers and smoke consumers.

DETROIT—Gar-Wood Engineering Co. has been incorporated with 100,000 no par shares and $100,000 capital by George B. Wood, 4196 Bellevue avenue, to manufacture and deal in boilers, burners, machinery and equipment.

DETROIT—Batten & Riley Inc. has been incorporated with $25,000 capital by Sydney C. Batten, 7-218 General Motors building, to deal in automobile parts, manufacturing steels, textiles, lumber and nonferrous metals.

DETROIT—Anchor Lock Washer Co. has been incorporated with 10,500 no par shares and $5000 capital by Burton J. Plumley, 115 West Willis avenue, to manufacture and sell lock washers and automotive products.

DETROIT—Combustion Products Corp. has been incorporated with 270,000 no par shares by David A. Howell, 3400 Union Trust building, to manufacture, sell and install fuel burners and steam boilers.

DETROIT—Great Lakes Equipment Co. has been incorporated with $25,000 capital by Charles B. Soderquist, 7100 West Jefferson street, to manufacture and deal in motor parts, accessories and equipment; agricultural, industrial and aerial equipment accessories; and engage in the servicing of brake equipment.

LAPEER, MICH.—Lapeer Engineering & Mfg. Co. has been incorporated with $10,000 capital by James Hankins, Howard and Higley streets, to build and deal in metal and wood specialties.

STEVENSVILLE, MICH.—Maclu Mfg. Co. has been incorporated with $100,000 capital by Allen L. McGregor and John DeVries, to manufacture and generally deal in automobile equipment.

WHITEHILL, MICH.—Harry Young's Anvil has been incorporated with $10,000 capital by Harry Young, to manufacture and sell metal novelties.

KANSAS, CITY, MO.—Western Laundry Equipment Co. has been incorporated with $100,000 capital by E. C. Winters, 907 Midland building, to engage in manufacturing of laundry equipment.

ST. LOUIS—Matafoils Inc. has been incorporated with $20,000 capital by Harry C. Avis, 5142 Waterman street, to deal in tin and aluminum foil, sheet steel and metal sheeting.

ATLANTIC CITY, N. J.—Union Automatic Amusement Co. has been incorporated with $125,000 capital by Paul J. Farley, Real Estate & Law building, to manufacture automatic devices.

BAYONNE, N. J.—Rudolff Level Co. has been incorporated with 1000 common shares by Aaron A. Melniker, Broadway and Twenty-fifth street, to manufacture tools.

HIGH BRIDGE, N. J.—Ada Exact Level & Tool Co. has been incorporated with $50,000 capital by Johnson V. Aller, Clinton, N. J., to deal in tools.

IRVINGTON, N. J.—Rotal Machine Works Inc. has been incorporated with $25,000 capital by David Silver, attorney, 31 Clinton street, to manufacture electric motors.

IRVINGTON, N. J.—Beetsal Inc. has been incorporated with $50,000 preferred and 2000 common shares by Maynard O. Klemmt, 43 Hill street, Newark, N. J., to manufacture tools.

JERSEY CITY, N. J.—Hudson Tin Mfg. Co. Inc. has been incorporated with $100,000 capital by Marcus E. Donnelly, attorney, 591 Summitt avenue, to manufacture tinware.

KEARNY, N. J.—Sloan & Chace Mfg. Co. has been incorporated with $50,000 capital by Edward J. Madden, to manufacture precision tools.

NEWARK, N. J.—Eclipse Engineering Co. has been incorporated with $100,000 preferred and 2000 common shares by Louis Ogust, attorney, 9 Clinton street, to manufacture and deal in motors.

NEWARK, N. J.—Balsa Float Co. has been incorporated with $60,000 preferred and 400 common shares by William Headley, lawyer, 124 Market street, to manufacture floats and airplanes.

WEST ORANGE, N. J.—Dictating Machine Ediphone Corp. has been incorporated with $125,000 capital to manufacture sound-recording machinery.

BROOKLYN, N. Y.—Progress Lightingware Corp. has been incorporated with $10,000 capital by B. J. Monka, 26 Court street, to deal in machinery.

BROOKLYN, N. Y.—Robert Simpson Steam Boiler Works has been incorporated with $20,000 capital by J. McLaren, 305 Broadway, New York.

BROOKLYN, N. Y.—Novelty Metalcraft Co. has been incorporated with $10,000 capital by J. Englander, 205 East Forty-second street, New York, to deal in metal cups.

NEW YORK—Metropolitan Ship Scaling Corp. has been incorporated with $10,000 capital by M. J. Fermen, 30 Ira court, Brooklyn, N. Y., to repair ships.

NEW YORK—Interstate Appliances has been incorporated with 500 common shares by O'-Sullivan & Gennery, 400 Madison avenue, to deal in machinery.

NEW YORK—Rialto Metal Spinning & Stamping Co. has been incorporated with $20,000 capital by J. W. Friedman, 2 Lafayette street, to operate a machine shop.

New Trade Publications

FORGINGS—Camden Forge Co., Camden, N. J., devotes a current bulletin to its forgings for railroad use, a product it has developed for 28 years.

ELEVATORS—Elevator equipment manufactured by the Warner Elevator Mfg. Co., Cincinnati, is described in a bulletin covering an installation in a plant where accurate leveling and smooth operation is an essential.

DIE HEADS—National Acme Co., Cleveland, has issued a bulletin on die heads of the opening type, revolving, with quick removable circular chasers. The heads are supplied in six sizes. The bulletin presents data and illustrations covering the devices, with parts list and prices.

LUBRICATION—The monthly publication of the Texas Co., 135 East Forty-second street, New York, devoted to lubrication, covers hydraulic power generating equipment. It follows the usual coverage of the subject, illustrated to show application to many types of machinery in this classification.

PORTABLE DRILL—Guibert Steel Co., 1716 Youghiogheny avenue, Pittsburgh, has issued a catalog of its toggle-bug portable drill, adapted to use of fabricators. Illustrations show application to drilling material aboard railroad cars or in the plant yard, moving the drill rather than the steel.

SHEAR KNIVES—Heppenstall Co., Pittsburgh, devotes a current bulletin to its shear knives, made for various purposes in cutting metals. Illustrations show processes of manufacture. Information valuable to users of such knives is included and data tables provide much useful information.

ELECTRICAL DEVICES—Electrical Association of New York Inc., 100 East Forty-fifth street, New York, has compiled a handbook of electrical information, in twelve sections, by representatives of various branches of the electrical industry. It is written in nontechnical language adapted to the understanding of all. Subjects covered are: Illumination, industrial control, heating, material handling, motors, refrigerators, signals, signs, switchboards and panelboards, tools, ventilation and wiring.

THE BETTER *the* WEAPON THE BETTER *the* SOLDIER

IN the World War, whenever a doughboy found an abandoned Springfield in the debris of the battlefield, he would throw away the foreign rifle with which our hard-pressed War Department had been compelled to replenish our scanty stocks, and seize the more efficient weapon. Something like this happens in a machine shop when CIRCLE C HIGH SPEED STEEL is introduced. Machinists try many ruses to obtain one of the new tools. And when they get one, they cling to it.

A large Ohio manufacturer, now standardized on CIRCLE C, showed us a number of time studies, from which the following is quoted:

"This machine rough turns, bores and faces cast iron wheels for a certain type of sliding door. With standard high speed steel tools, the production was 144 wheels per day. With CIRCLE C TOOLS, it is 243 wheels—more than a 68% increase."

Yet this manufacturer's annual expenditure for cutting tools is less than before, for CIRCLE C TOOLS are long lived.

A small order for Toolholder Bits will convince you.

Drills made of CIRCLE C HIGH SPEED STEEL may be obtained from the MORSE TWIST DRILL & MACHINE COMPANY, New Bedford, Mass.

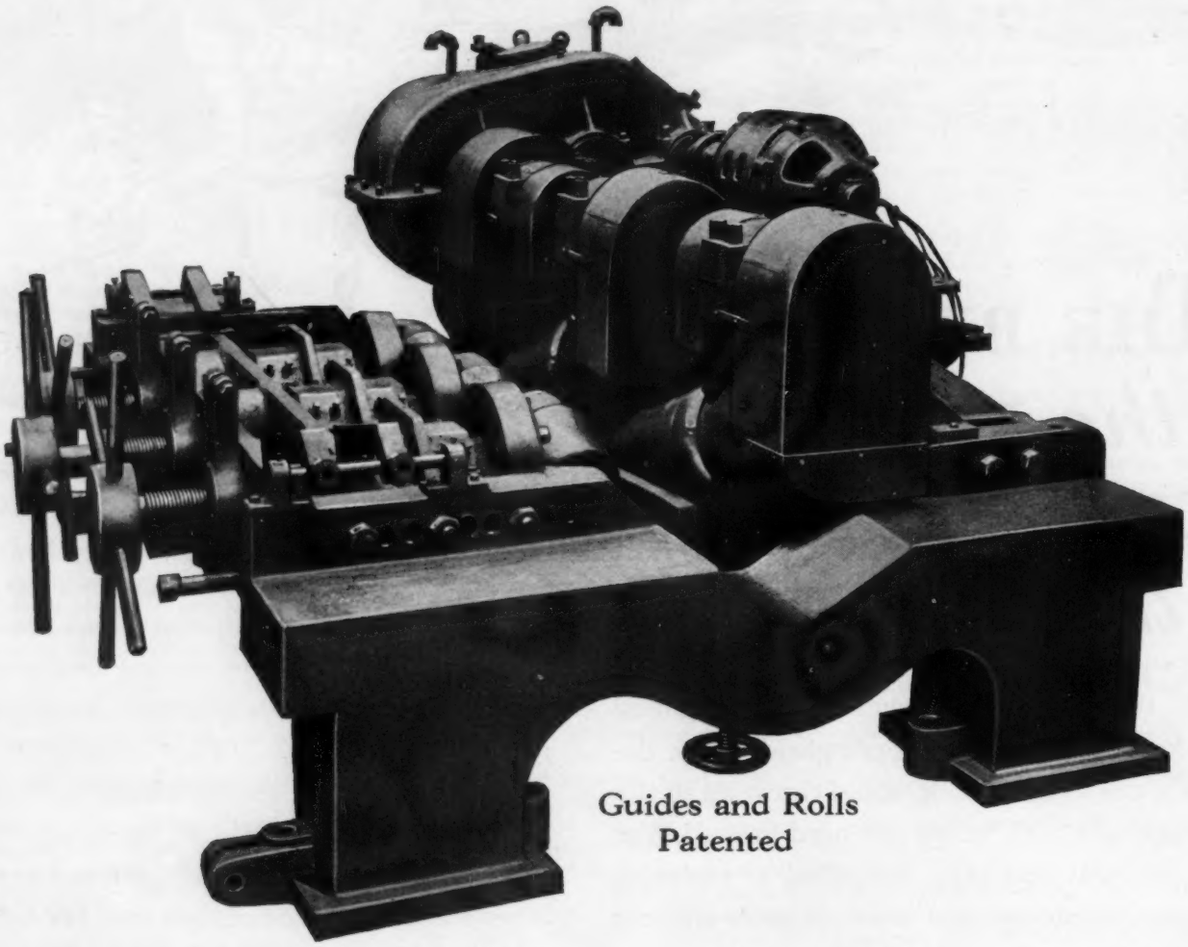
FIRTH-STERLING STEEL COMPANY

WORKS: McKEESPORT, PA.
GLOBE WIRE DIVISION
SHARPSBURG, PA.
NEW YORK DETROIT
BOSTON CLEVELAND
PHILADELPHIA CHICAGO
HARTFORD LOS ANGELES

SUTTON *No. 3B*

Round Straightening Machine

PATENTED



Guides and Rolls
Patented

Speed:
60 to 180 feet
per minute

Capacity:
2½" O.D. to 8 5/8"
O.D. Tubes. 2½"
to 6" Bars.

Write for Bulletin

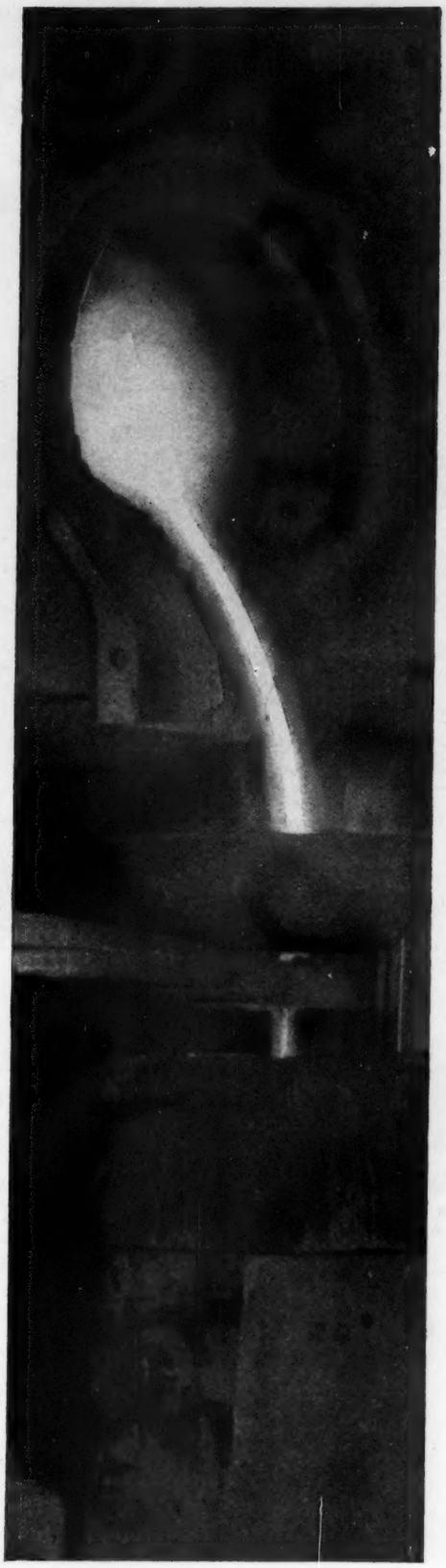
A NEW DESIGN

Enclosed Helical Gear Drive
All Bearings Except Drive Rolls Anti Friction Type
Adjustable Side Frame for Rigidity

Improved Gear Guards
Built for Sliding Shoes for Alignment
Special Rigid Guide Arrangement

SUTTON ENGINEERING CO.
PARK BUILDING PITTSBURGH, PA.

A new melting process establishing new standards of tool steel performance



Though of course the cutting quality of any high speed steel is dependent primarily upon correct chemical composition, the control of the melting plays a part of great importance in determining the ability of the steel to hold its cutting edge through long, heavy cuts at high speeds.

It is recognition of this fact that has led Bethlehem to install high-frequency electric induction furnaces for the melting of all of the finer grades of tool steel. The rapid circulation of the molten metal in these furnaces and the close temperature control make possible the maintenance of standards of quality that have heretofore existed only in the laboratory.

Bethlehem Special High Speed Tool Steel made in the high-frequency electric induction furnace has been subjected to the most searching tests and has demonstrated a cutting capacity that establishes new and far higher standards of machining efficiency. It takes deep cuts combined with surface speeds that utilize the full capacity of the machine tools. It holds its cutting edge at exceptionally high temperatures and takes surprisingly long cuts without regrinding.

The remarkable cutting characteristics of this super-refined Bethlehem Special High Speed Tool Steel have deeply impressed every machinist who has tried it.

BETHLEHEM STEEL COMPANY

General Offices: Bethlehem, Pa.

District Offices: New York, Boston, Philadelphia, Baltimore, Washington, Atlanta, Buffalo, Pittsburgh, Cleveland, Cincinnati, Detroit, Chicago, St. Louis.

Pacific Coast Distributor:
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BETHLEHEM

Special High Speed Tool Steel

EDGAR T. WARD'S SONS CO.

In Philadelphia~

Smooth service—service without annoying hitches, breaks, and interruptions—is the watchword at the Philadelphia Ward-house. This service must be satisfactory in every respect because of the growing list of well established clients.

In this vast district every sort of problem presents itself due to the wide variety of manufacturers. The wide range of stock at Philadelphia and the intelligent filling of orders is an outstanding feature of the Ward service at this point.

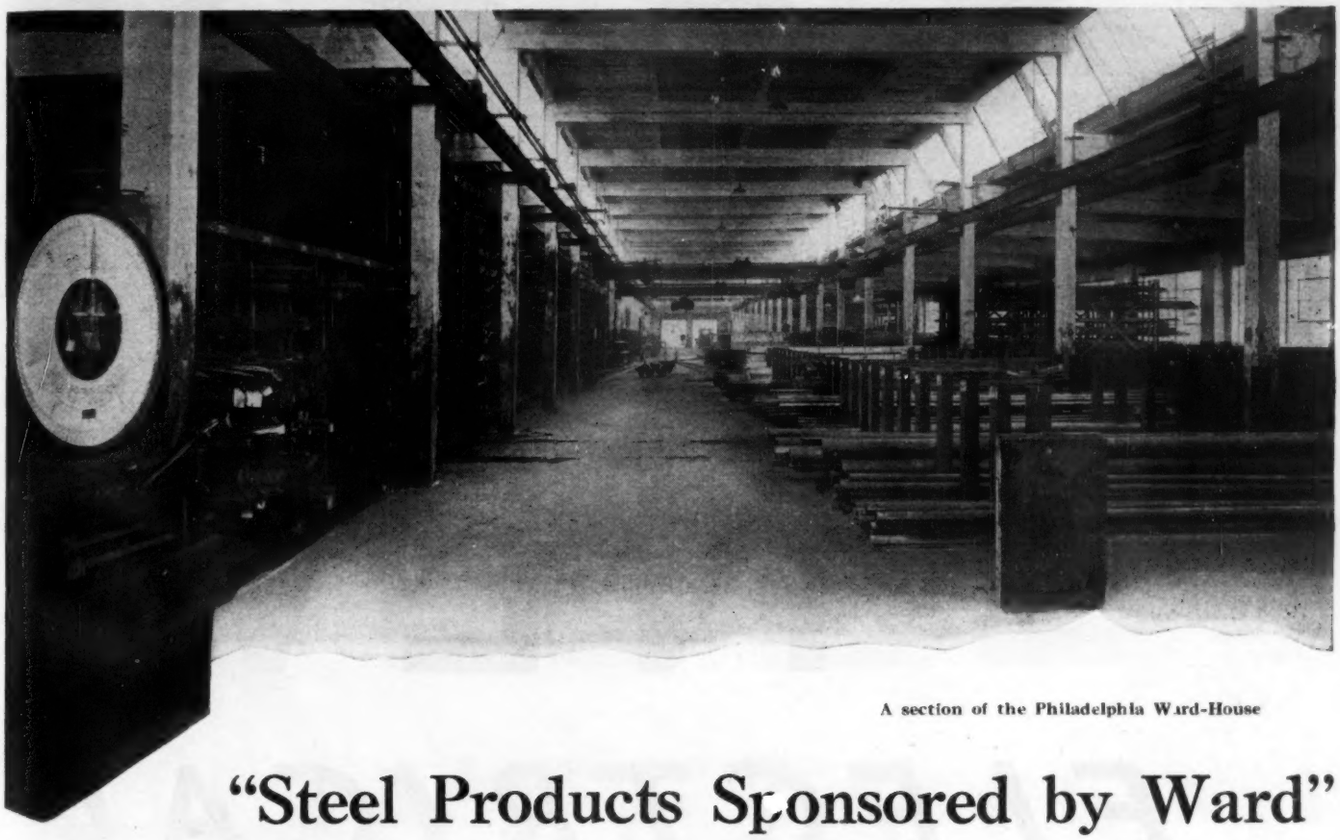
If you have a problem—if you need steel in quantity or an "every day" delivery, let us discuss the subject thoroughly. You should ask for

Nebraska 6400

Manager

The World's Largest Distributors of Fine Steel Products

EDGAR T. WARD'S SONS CO.



A section of the Philadelphia Ward-House

"Steel Products Sponsored by Ward"

Aircraft Steels { Cold Drawn Seamless Steel Tubing / Cold Rolled Strip Steel / Cold Finished Alloy Bars } Certified to Government Specifications

Cold Finished Steel Bars and Turned and Polished Shafting

Cold Rolled Strip Steel and Round Edge Flat Wire

Cold Drawn Mechanical Steel Tubing

Full Finished Deep Drawing Sheets

High Silicon Electrical Sheets { Apollo Radio / Apollo Special / U. S. and Dynamo

Music Spring Wire and Polished Drill Rods

ULTRA SUPERIOR SWEDISH COLD ROLLED STEELS
(Munkfors' Brand)

Spring and Tool Steels Band and Butcher Saw Steels Thickness Gauge, Rule and Tape Steels, etc.

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PHILADELPHIA WARD-HOUSE—Cedar and Westmoreland Streets

BOSTON, 44 Farnsworth St.
BUFFALO, 39 River St.
CHICAGO, 1455 W. 37th St.
CLEVELAND, 1210 E. 55th St.
DETROIT, 1300 Fort St., West
NEWARK, 400 Frelinghuysen Ave.
MILWAUKEE, 57 Ave. and Burnham St.

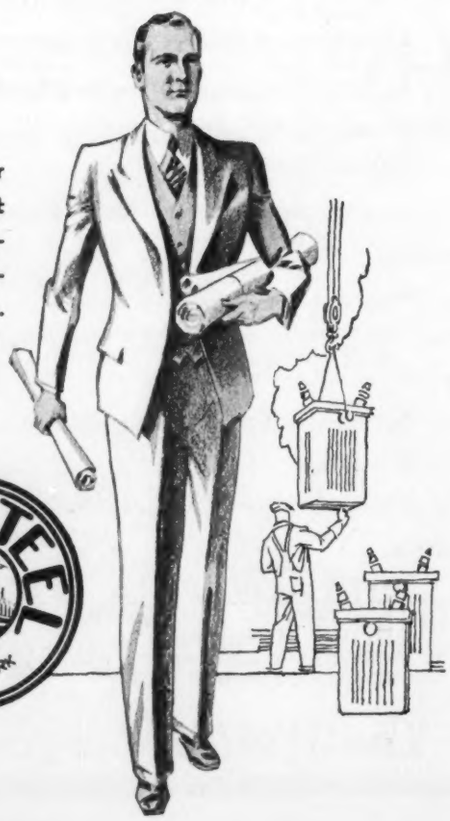
The World's Largest Distributors of Fine Steel Products

and now....

NEW ELECTRICAL

The Newsteel Magnetic Engineer is ready to give you the benefit of his knowledge and resourcefulness in working out the right Electrical Sheet for your specific needs.

SAVE WITH STEEL



NEWSTEEL TRADE MARK

STEEL SHEETS

HERE is news . . . particularly interesting and valuable to manufacturers of Transformers, Dynamos, Generators, Alternators, Motors, Rotors and Stators, Radio and other electrical equipment.

Newsteel enters this responsible industry with full realization of the extreme care and accuracy, and the constant, close personal control necessary to successful results with this important type of steel sheet.

Modern equipment, exceptional testing facilities and a skilled, experienced personnel assure the buyers of **Newsteel Electrical Sheets** a service and quality comparable in every respect with the satisfactory high standard to which manufacturers are accustomed in all other types of Newsteel Sheets.

We would like to tell you some facts about the high degree of flatness, uniformity and additional desirable qualities of Newsteel Electrical Sheets. Drop us a line advising when we might see you.

THE NEWTON STEEL COMPANY, YOUNGSTOWN, OHIO

Detroit Cleveland Chicago New York Indianapolis

PLANTS AT NEWTON FALLS, OHIO AND MONROE, MICHIGAN

STEEL MILLS *will*

Reliance now offers fully-enclosed fan-cooled induction motors that are interchangeable in mounting dimensions with open motors of the same rating up to 100 hp. 1200 r.p.m.

100 hp. 1200 r.p.m. Fully-enclosed Fan-cooled Reliance Induction Motor.

Many mills have already learned the advantages of the enclosed fan-cooled motor in the smaller sizes. This design provides the protective features of the ordinary enclosed motor at lower cost and without the increase in size and weight formerly required.

All of these advantages are now extended in Reliance Motors to sizes up to 100 hp. 1200 r.p.m. A principle of cooling is used which makes it possible to supply a complete line of enclosed fan-cooled motors which have exactly the same mounting dimensions as our standard open motors of the same horsepower and speed ratings. Limiting dimensions are the same except for extra length at the front end which does not exceed three inches.

Write for our new Bulletin 107 which gives full details of this interesting and money-saving development.

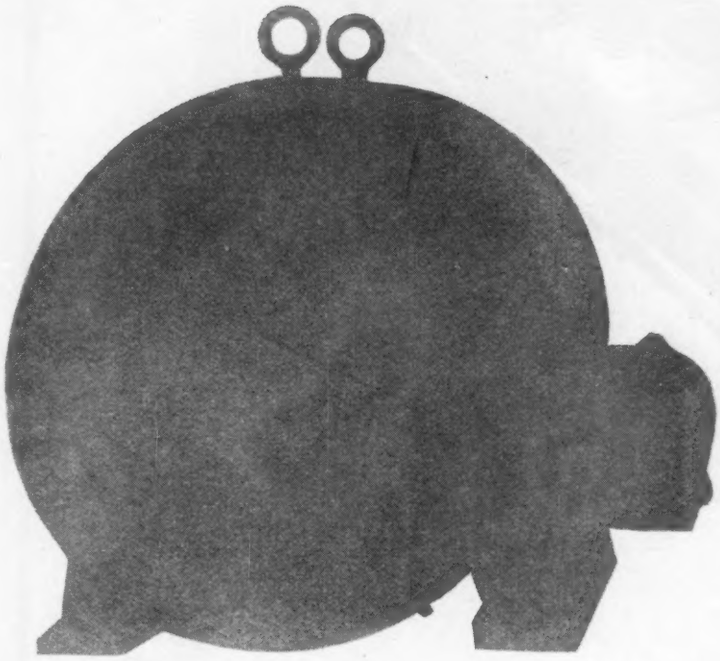
Reliance Electric & Engineering Co.

1082 Ivanhoe Road **Cleveland, Ohio**

Branches: Birmingham, Boston, Buffalo, Chicago, Cincinnati, Detroit, New York, Philadelphia, Pittsburgh, St. Louis

Representatives: Denver, Mountain States Mach'ry Co.; Kansas City, Mo., Chas. L. Ward Co., Knoxville, A. L. Pollard; Los Angeles, San Francisco, Utilities Equipment Corpn.; Seattle, H. B. Squires Co.

ll BENEFIT *from this improvement in* ~ ~ MOTOR DESIGN

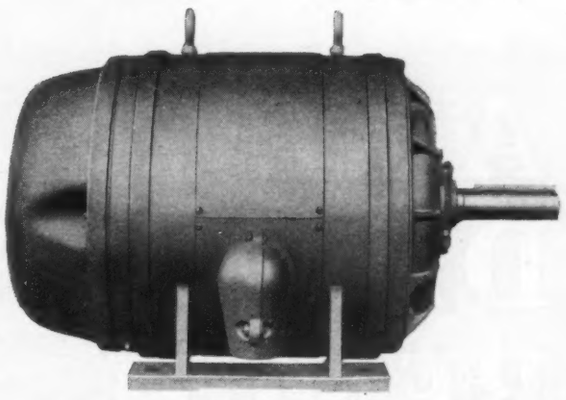


100 hp. 1200 r.p.m. Open-type Reliance Induction Motor.

Don't think of these motors simply for very bad conditions. There are many places where open motors may now be giving fairly satisfactory results that savings in inspection, cleaning and repairs would more than justify the use of these new motors.

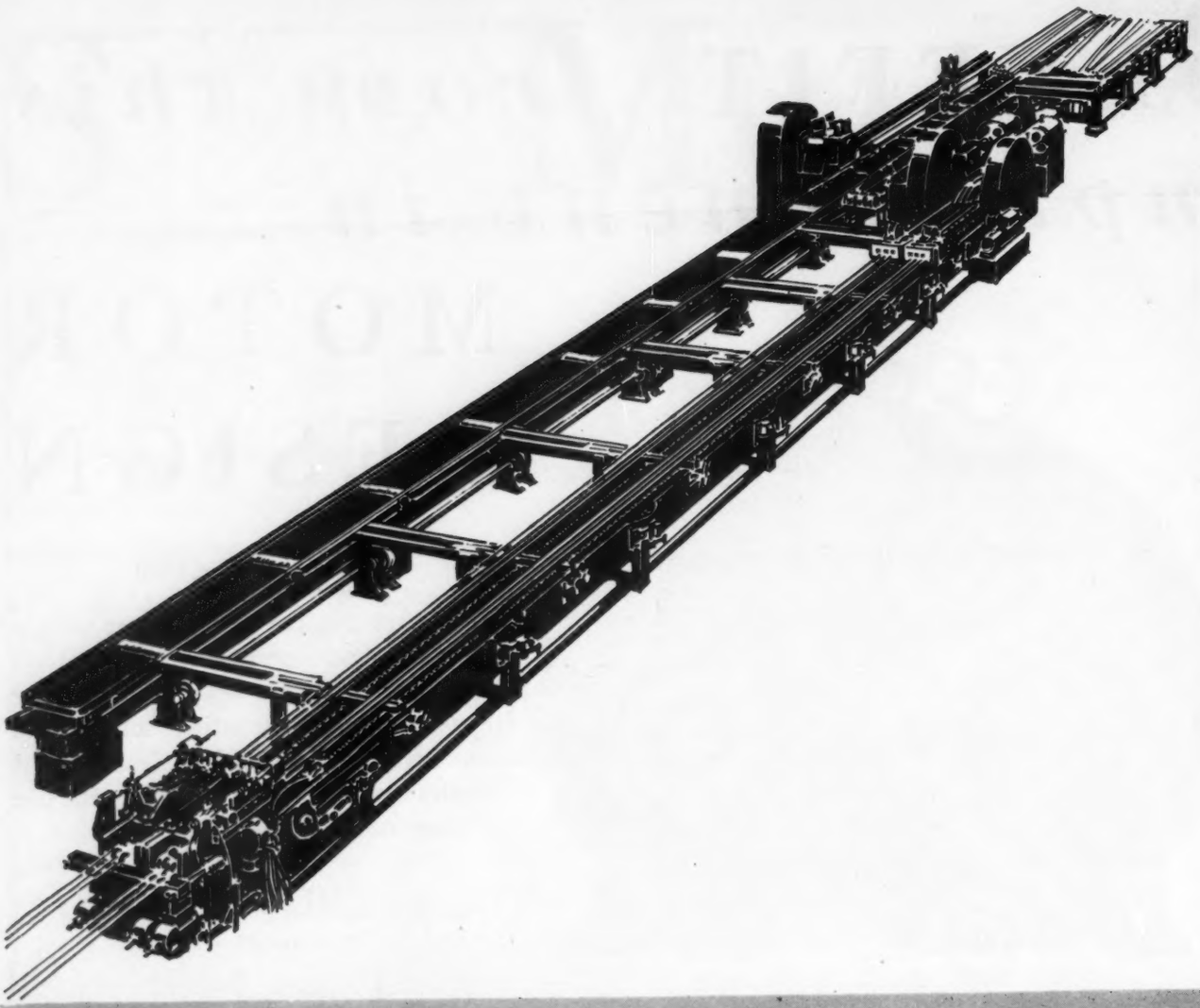
An aid in the struggle against dirt

Reliance Enclosed Fan-cooled Motors are helping the steel industry reduce its maintenance bill. These motors will last longer because the windings are sealed against dirt. Air gaps cannot become clogged. You get this protection at reasonable cost.



A frame construction is used for all Reliance Induction Motors. The frame is fabricated entirely from bar steel, electrically welded. This provides a strong and rigid enclosure for the stator core.

RELIANCE A-C D-C MOTORS
with Ball Bearings



A NEW AUTOMATIC DRAW-BENCH

Adaptability to meet the frequency in size changes, and reduction of man hours per ton, are essential features of this new unit. For cold finishing of tubes, rods and bars of steel, copper, brass and aluminum. Write for complete information.

The AETNA-STANDARD ENGINEERING CO.

YOUNGSTOWN · OHIO

DESIGNERS AND BUILDERS OF ROLLING MILL MACHINERY

Densite

MEANS

CLEANER, MORE UNIFORM and BETTER STEEL

DENSITE REFINED STEELS

are obtainable from your *REGULAR* source of supply.

Write "DENSITE REFINED" into your specifications.

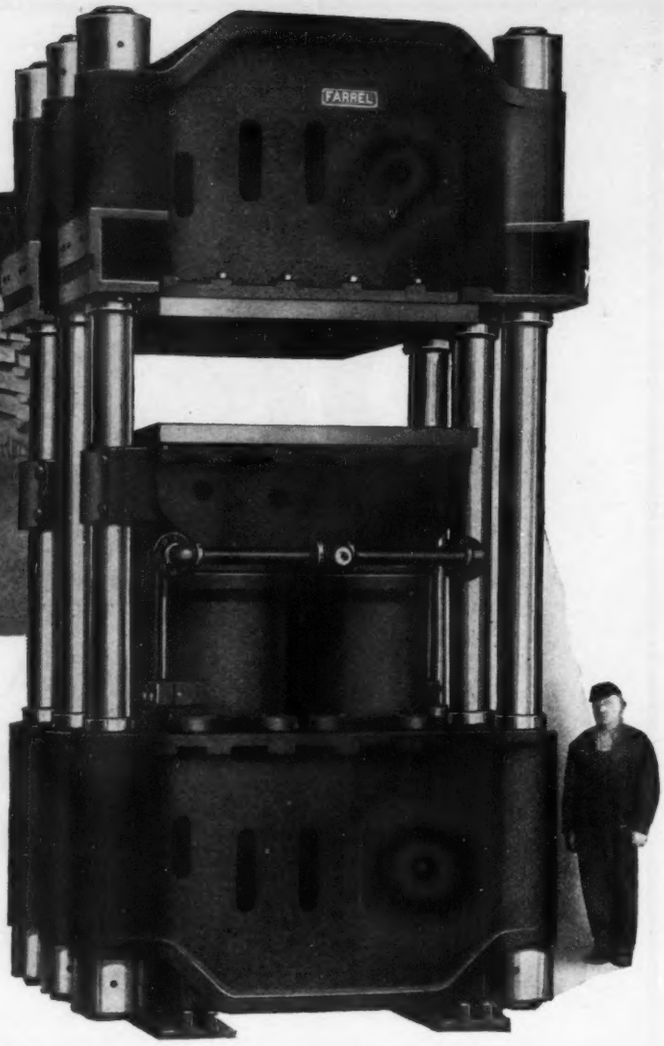
A New Name in the STEEL INDUSTRY

REFINED STEEL PRODUCTS CO.

CLARK BLDG. PITTSBURGH

Right: *74" x 108" hydraulic press with six 20" diameter rams exerting a total pressure of 2,000 tons, manufactured by FARREL-BIRMINGHAM COMPANY, Ansonia, Conn.*

Below: *2 hydraulic press cylinders of "Maxtensile". These cylinders contain 1.50% Nickel and test 50,000 to 60,000 lbs. per square inch.*



MAXTENSILE...

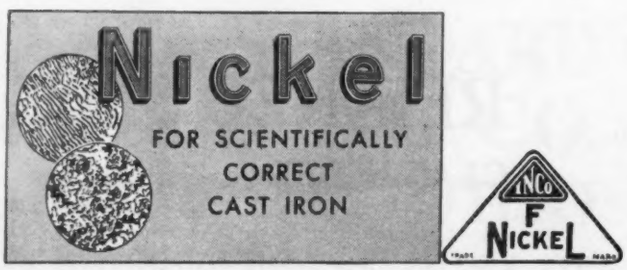
a material that combines high strength and rigidity in hydraulic press castings

A MATERIAL sufficiently strong and tough to accommodate peak loads attended by high stresses and yet rigid enough to keep deflection at a minimum is essential for heavy duty hydraulic presses.

"Maxtensile", a Nickel Cast Iron, combines certain good qualities of cast iron and steel and is replacing castings of these materials previously used in hydraulic presses. Its non-flexing qualities, combined with high strength, resistance to impact and fatigue, as well as improved wearing qualities, make "Maxtensile" ideally suited to this service.

"Maxtensile" in addition, has other valuable features of direct interest to machinery manufacturers. It is close grained and dense throughout heavy sections and also machines easily. These characteristics, in hydraulic cylinders, for instance, tend to eliminate the possibility of expending time and money in finishing cylinder castings only to find the material under the surface so spongy and open grained that the cylinder will not withstand the water pressure for which it is required and consequently must be scrapped.

"Maxtensile" is a high grade, high strength metal furnished by the Farrel-Birmingham Company, Ansonia, Conn. The addition of Nickel to a special base mixture provides physical properties greatly in excess of those obtained in the conventional gray cast iron or semi-steel. Many customers of this foundry are finding it possible to replace more expensive materials with "Maxtensile".



Our casting specialists will gladly discuss your casting problems with you.

THE INTERNATIONAL NICKEL COMPANY, INC., 67 WALL STREET, NEW YORK, N. Y.

NEW

Westinghouse-Nuttall

SINGLE AND DOUBLE REDUCTION

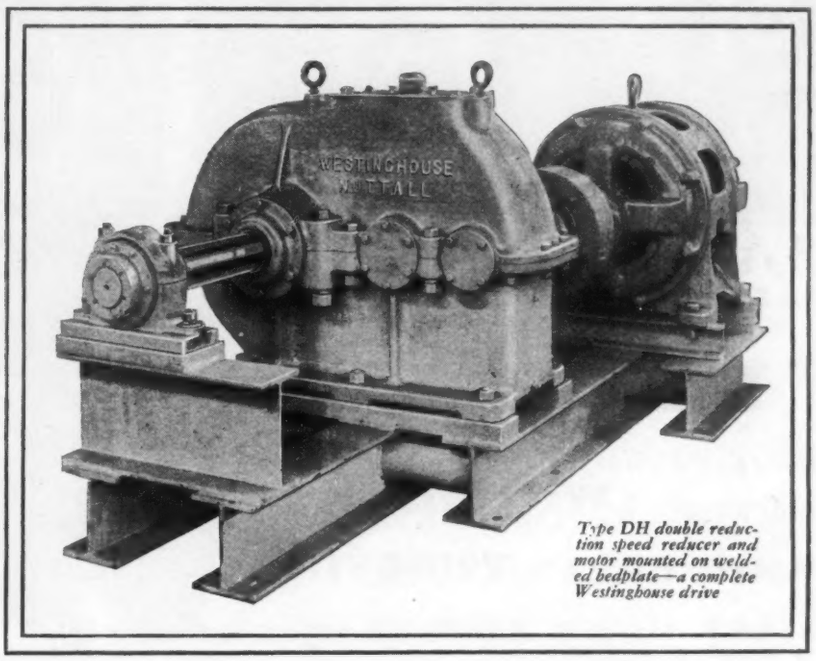
SPEED REDUCERS

2 types

24 sizes

28 ratios

1 to 635 hp. capacities



Type DH double reduction speed reducer and motor mounted on welded bedplate—a complete Westinghouse drive

FEATURES

1. Single helical gearing—long and short addendum teeth—made from .40-.50 carbon steel.
2. High-speed pinions integral with shafts—made from .40-.50 carbon or alloy forged steel, and heat-treated.
3. Anti-friction bearings throughout—two types.
4. Shafts for low and intermediate speeds—made from .40-.50 carbon steel—ground fits for bearings and gears.
5. Lubrication by positive splash system—bayonet gauge for checking oil level.
6. Cases cast from close-grained gray iron—interiors free from projections and cored openings.
7. Efficiency at full load—98 to 99 per cent single reduction units, and 96 to 98 per cent for double reduction units.

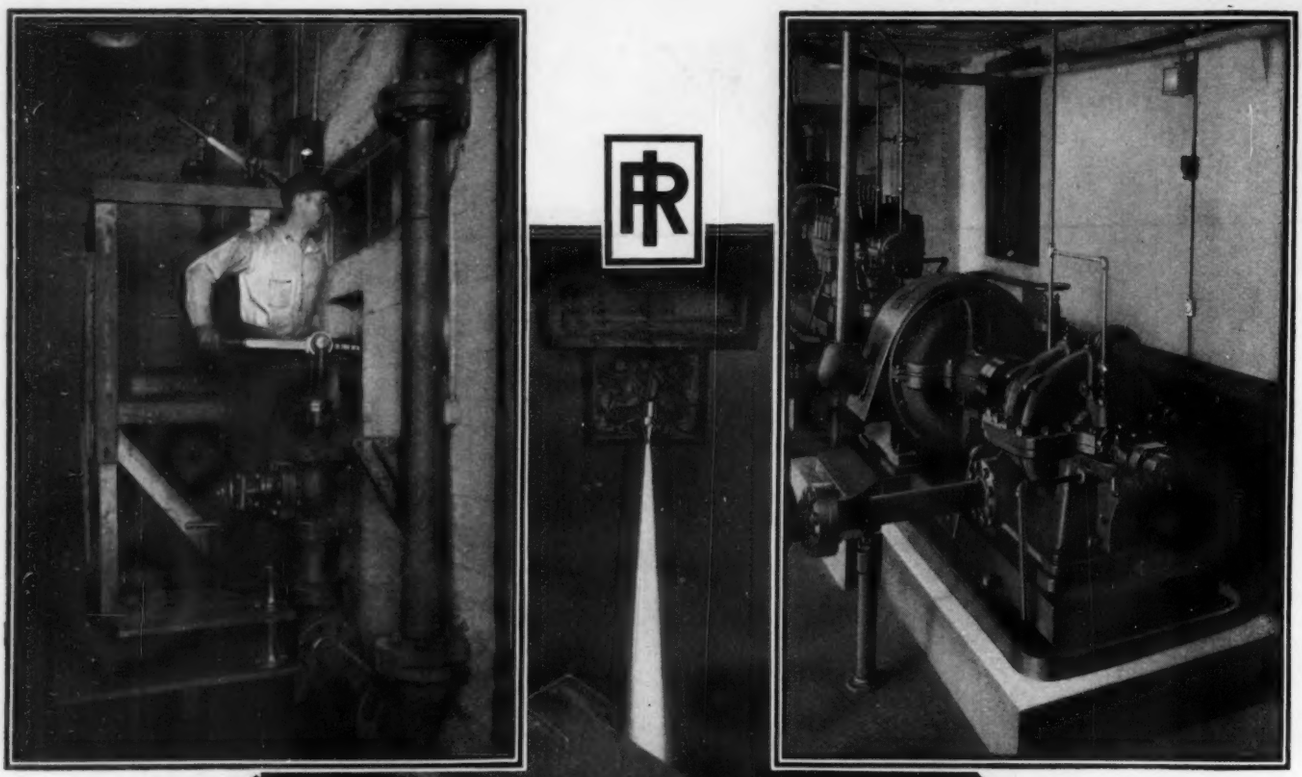
Write our nearest office for Leaflet 29742 containing details, ratings and dimensions.

Service, prompt and efficient, by a coast-to-coast chain of well-equipped shops

Westinghouse

T 31258

TUNE IN THE WESTINGHOUSE SALUTE OVER THE N. B. C. NATION-WIDE NETWORK EVERY TUESDAY EVENING.



Startling Savings Are Being Made

with the hydro-blast method of removing cores and sand

R-2056

In a well-known New England foundry, castings that formerly required two and one-half days' work by three men are now cleaned out in five hours by one man. A ten-ton casting of a machine bed that formerly took three men one week to do is now cleaned in seven hours.

It is estimated that the hydro-blast method of removing sand and cores has reduced the cost of such work more than 60% in this foundry.

Cameron Pumps supply the water at 450 lbs. pressure and assure positive and uninterrupted operation of the equipment.

INGERSOLL-RAND COMPANY - 11 Broadway - New York City

Brauches or distributors in principal cities the world over

For Canada refer—Canadian Ingersoll-Rand Co., Limited, 10 Phillips Square, Montreal, Quebec

383-DV

Ingersoll-Rand

Centralized Control—

insures unvarying high and uniform quality

PRODUCING its own raw materials, handling every manufacturing process in its own plants, Youngstown insures success for its products by the elimination of outside influences. This centralized control is a whip that compels rigid adherence to the highest, unvarying quality.

And with this standard of quality goes the Youngstown tradition of service which places the customer's needs first and cuts red tape to meet a customer's emergency.

THE YOUNGSTOWN SHEET AND TUBE COMPANY

One of the oldest manufacturers of copper-steel, under the well-known and established trade name "Copperoid"

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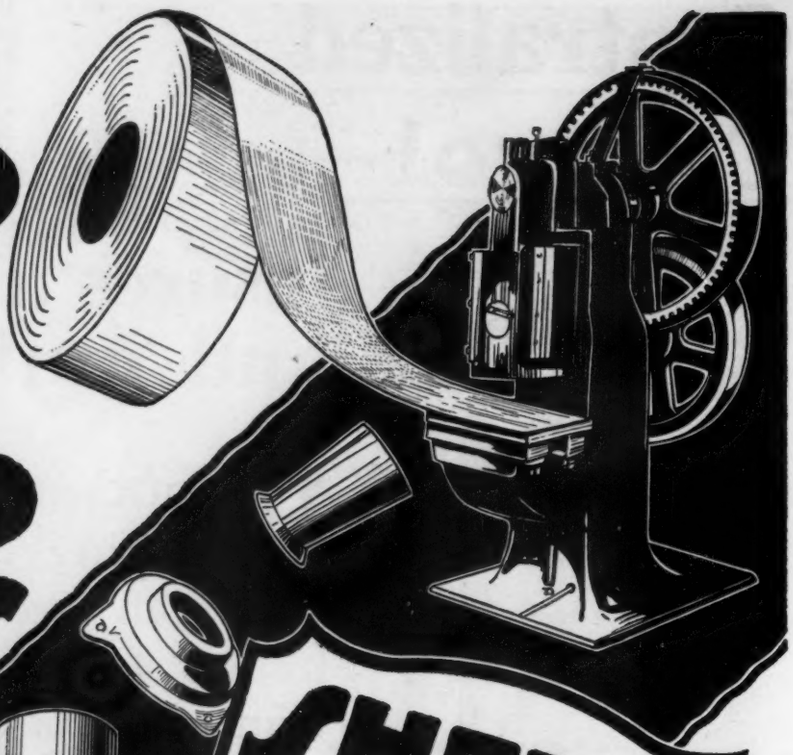
LONDON REPRESENTATIVE—The Youngstown Steel Products Co., Dashwood House, Old Broad St., London, E. C. Eng.

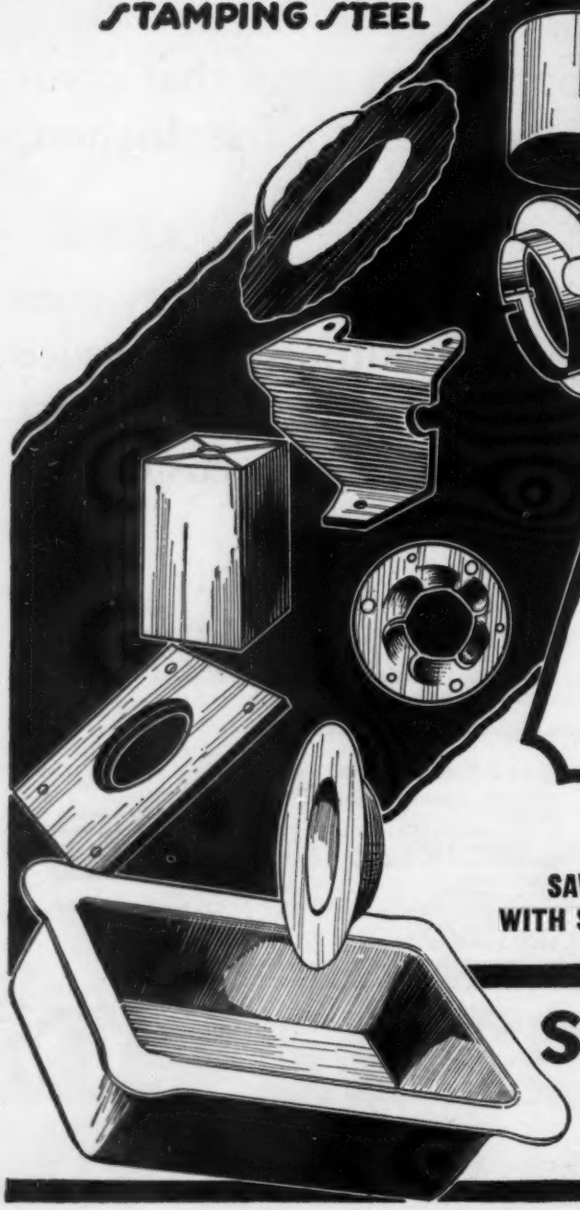
YOUNGSTOWN

GALVANIZED SHEETS PROTECT -::- SAVE WITH STEEL

COLD ROLLED AND HOT ROLLED STRIPS

STAMPING STEEL





SHEETS — STEEL AND GENUINE WROUGHT IRON

BLUE ANNEALED
BOX ANNEALED
STAMPING STEELS

SAVE
WITH STEEL

SHARON STEEL HOOP CO.
SHARON, PA.
Works:
Sharon, Pa. Lowellville, Ohio Youngstown, Ohio.

BOLTS
EMPIRE
TRADE MARK REG. U.S. PAT. OFF.
NUTS-RIVETS

RELATIVITY, thanks to Einstein, is a word that helps clear thinking.

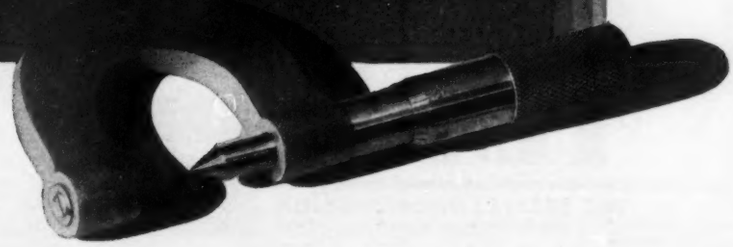
Bolts and nuts are relatively unimportant compared to the things they hold together.

Yet their relative importance *as bolts and nuts* explains why experienced manufacturers feel safer in sticking to the EMPIRE Brand.

RUSSELL, BURDSALL & WARD
BOLT AND NUT COMPANY
PORT CHESTER, N. Y.

ROCK FALLS, ILL. CORAOPOLIS, PA.

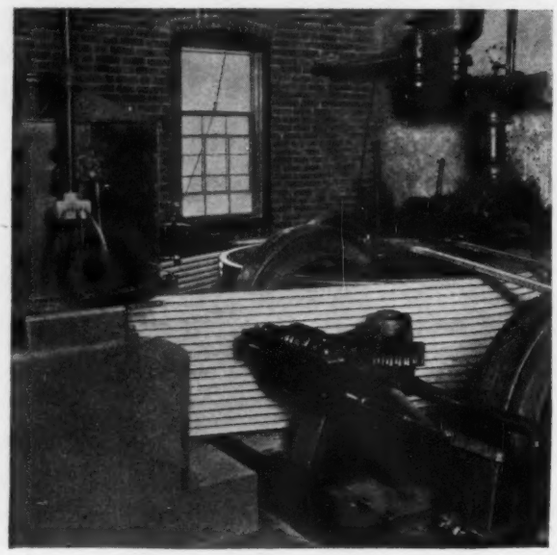
PHILADELPHIA · CHICAGO · DETROIT · SAN FRANCISCO · LOS ANGELES · SEATTLE · PORTLAND



TEXROPE DRIVES
Give *Continuous* Service with Almost No *Maintenance*

EVERYWHERE the trend is toward Texrope Drive. This short center transmission is always silent. It is clean, yet unaffected by dirt or moisture. Starting and acceleration are smooth . . . no jerks . . . no slip . . . no backlash.

Vibration is absorbed by the Texropes. The motor is protected from shocks. Bearing trouble due to the drive disappears. Continuous operation is assured. Costly shut-downs become a thing of the past.



Texrope is used as a vertical drive with most satisfactory results. This installation is at the Lovejoy Tool Co., Springfield, Vt. The 125 H. P. Texrope is operating a 93 K. W., 60 cycle, 2200 volt Allis-Chalmers induction generator from a water wheel. Only perfectly molded V-Belts can operate properly over sheaves on vertical shafts.

Texrope Drives require no belt dressing . . . no greasing . . . no oiling. There is no wear on the grooved sheaves and almost none on the rubberized-cord belts. Maintenance cost is reduced to a minimum. The belts are unusually long lived. Correct tension is easily maintained. Adjustments are seldom necessary.

Put Texrope Drives on the machines that give you the most trouble in your plant. Let the superior performance of Texrope prove its economy to you.

Over 75,000 Texrope Drives Giving Satisfactory Service

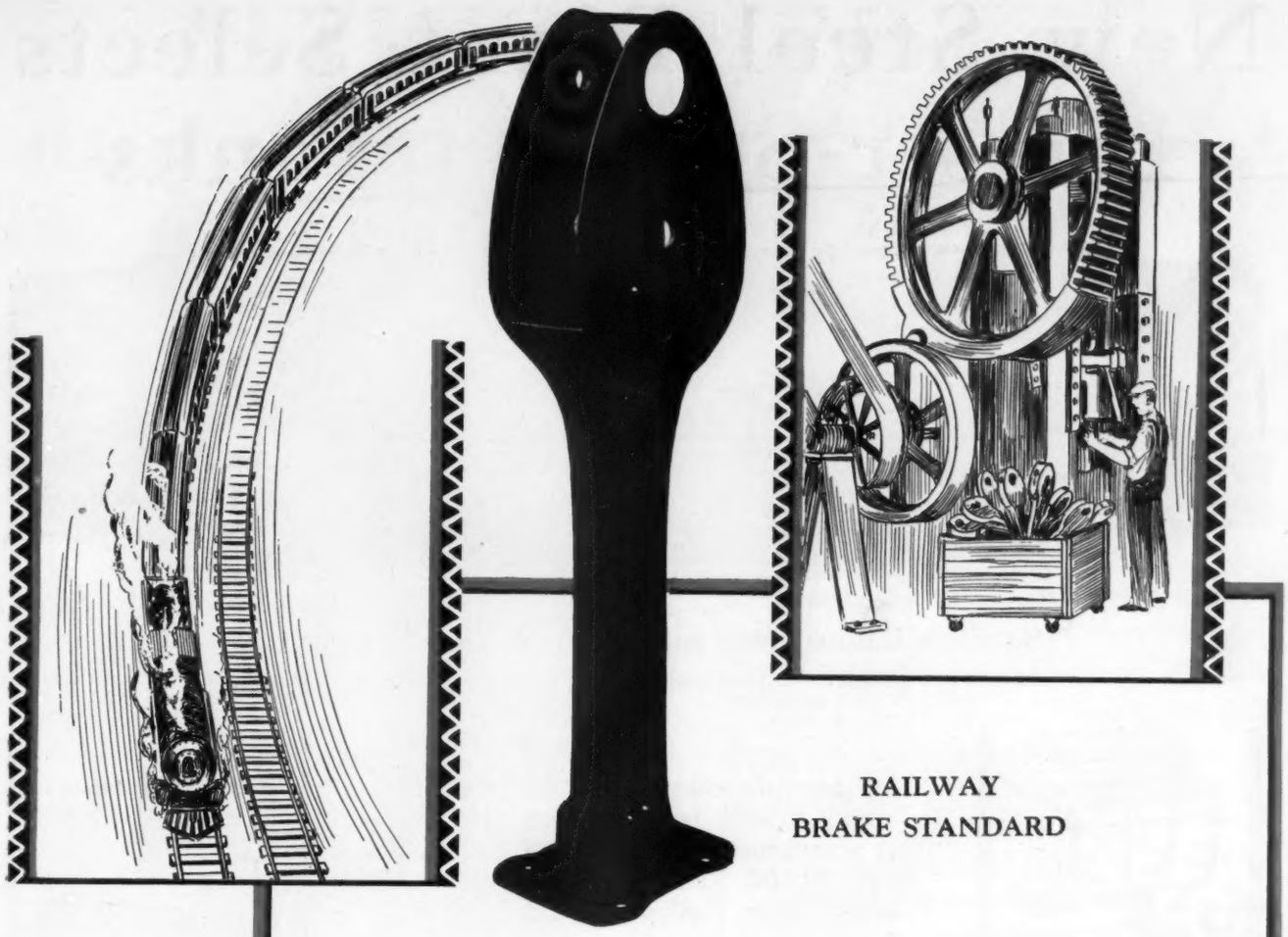
The Texrope Drive, originated by Allis-Chalmers, has proven to be "The Perfect Transmission." Insist on getting Texrope. Today over 75,000 Texrope Drives are in satisfactory service, in practically every industry, transmitting power up to 2,000 H. P. per single drive.

Texrope belts and grooved sheaves up to 100 H. P. and in ratios up to 7:1 are carried in stock at points that permit prompt shipment to all parts of the country. Let us show you how Texrope Drives will end your transmission troubles and help you cut costs. Write for a copy of Bulletin 1228-K.

ALLIS-CHALMERS MANUFACTURING COMPANY, (*Texrope Division*)
Specialists in Power Machinery Since 1846 Milwaukee, Wisconsin

ALLIS-CHALMERS
TEXROPE DRIVES

THE PERFECT TRANSMISSION — FOR EVERY PURPOSE ··



RAILWAY
BRAKE STANDARD

CROSBY STAMPINGS

The Crosby Company has been solving simple and difficult stampings problems for 34 years.

Our experience covers a wide industrial field, including Automobiles, Tractors, Cream Separators, Lawn Mower Industries, House Refrigeration, Railway Lighting Equipment, Aeroplane, Bicycles and many others. Zinc, brass, copper, duralumin, aluminum, open hearth, hot and cold rolled, high carbon or stainless steel.

Our engineers can solve your stamping problems.

Let the illustrated catalog tell the story.

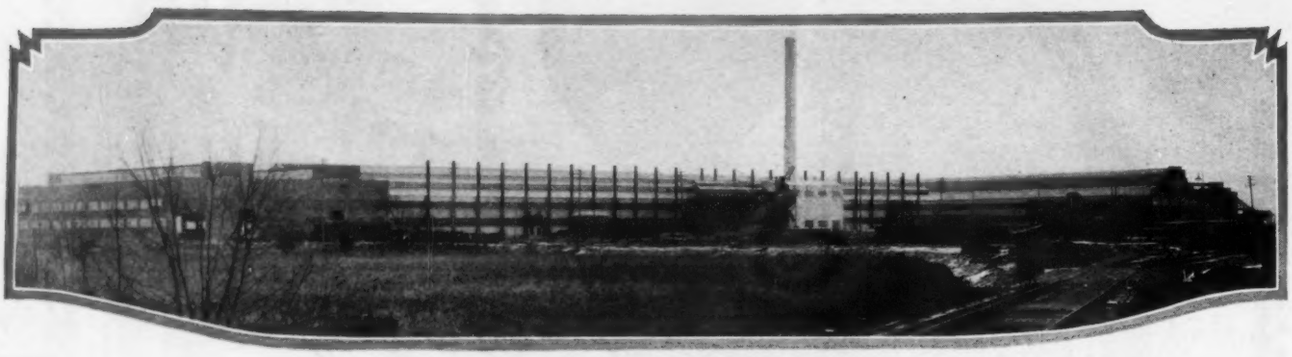
Stamping Pioneers

1896
34 YEARS IN BUSINESS
1930

THE CROSBY COMPANY

General Offices and Works: BUFFALO, N.Y.
Branch Offices: Chicago, Cleveland, Detroit, New York
City Center Bldg., Philadelphia, Pa.

New Steel Plant Selects Hauser-Stander Tanks



Semicontinuous sheet mill plant of Newton Steel Co., Monroe, Mich. Equipped with Hauser-Stander Tanks.

Tanner's Vat with Paddle Wheel
Tanners' and Chemists Drums
Rubber Lined Storage Tanks
Rubber Lined Tank Car
20 ft. Elliptical Tank

This recently completed plant, remarkable for many unique improvements in layout or plant arrangement, as described editorially in "IRON TRADE REVIEW", naturally selected Hauser-Stander Tanks for Pickling.

Hauser-Stander Tanks are so universally used and favorably known that they are readily accepted for new mills. Remember this when planning to replace or to add to equipment.

Hauser-Stander Pickling and Rinse Tanks are made of Long Leaf Yellow Pine or Douglas Fir from four to twelve inches thick—depending upon size of tank and service required—plain tanks for use in connection with the Mesta Machine, and extra heavy, partition tanks for the plunger type. All tie rods together with nuts and washers are of acid-resisting bronze or Monel Metal.

Consult us regarding *your* pickling problems. We design as well as manufacture and can make tanks to your order lined with lead or protective wood, or can meet any particular requirements relative to the solution you employ, its temperature, material to be pickled, stress and strain, and all such important factors.

"We Win With Quality"

The Hauser-Stander Tank Co.

Cincinnati, Ohio

That Beauty may have Permanence

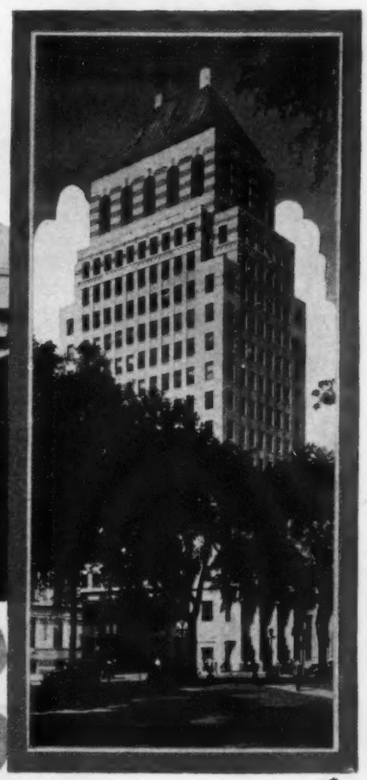
THE new home of the Merchants National Bank, Mobile, combines beauty of design and surroundings with an unmistakable air of permanence. To the casual observer, it is a monument of stone and brick, but, behind this outer casing stands the sturdy framework of *Tennessee Structural Steel*, adding the essential elements of safety, strength, and durability.

TENNESSEE COAL, IRON & RAILROAD COMPANY

General Offices: Brown-Marx Building
BIRMINGHAM, ALA,

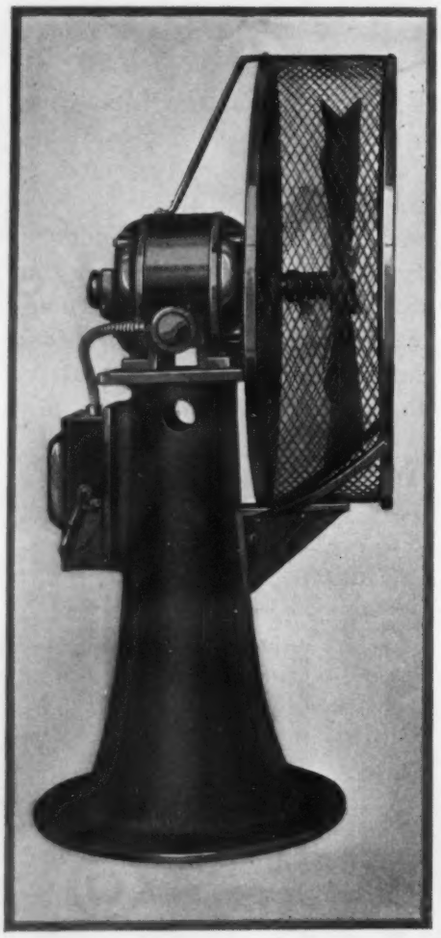
SUBSIDIARY OF UNITED STATES STEEL CORPORATION

Merchants National Bank Building, Mobile, Ala.
Warren, Knight & Davis, Birmingham, Architects.
Smallman Construction Company, Birmingham, General Contractors.
Virginia Bridge & Iron Co., Birmingham, Fabricators and Erectors.



TENNESSEE Structural Steel

TAKE IT WHERE IT'S HOTTEST



Perkins Man Cooler is portable. It can be readily conveyed by either crane or auxiliary truck which is furnished if desired.

There can be no disputing the fact that better quality, fewer errors, fewer accidents, and greater volume result from the use of Man Coolers to relieve workers in hot places.

Perkins Man Cooler is the development of long experimentation by expert ventilating, mechanical, electric and safety engineers.

Write for complete information today.

PERKINS MAN COOLER

Trade Mark Reg. U. S. Pat. Off.

B. F. Perkins & Son, Inc.

Engineers and Manufacturers

Holyoke—Mass.

American QUALITY Steel & Wire Company

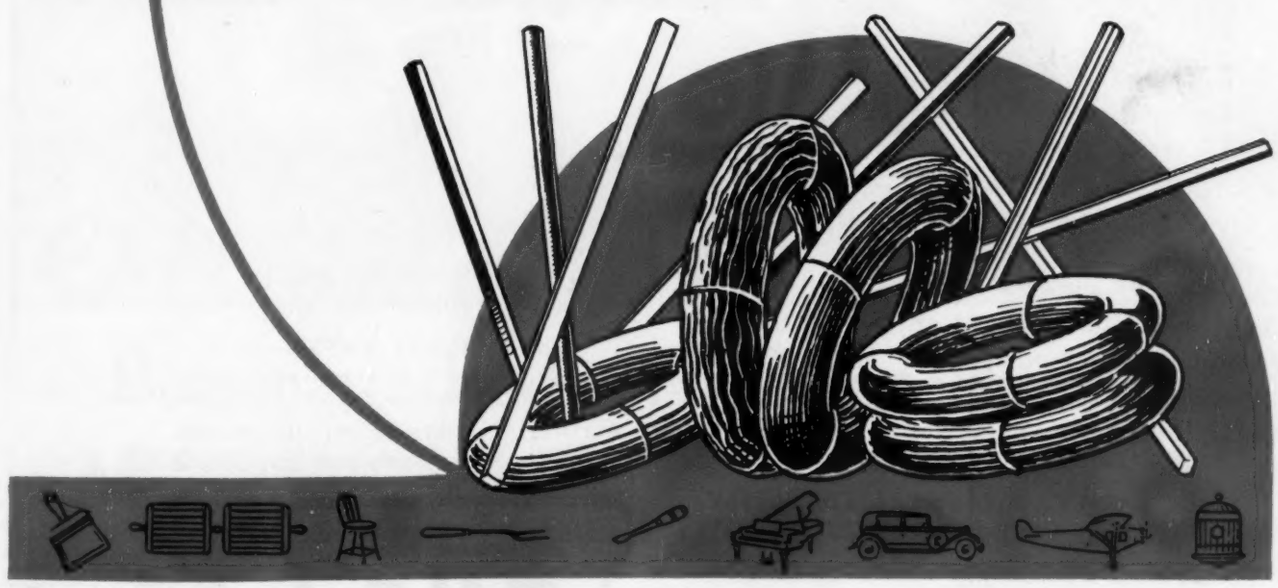
WIRE FOR MANUFACTURING

A DEPENDABLE SOURCE OF SUPPLY

So vital is wire to industry—so dependent on it is the quality of finished products—that most manufacturers turn to the American Steel & Wire Company, as the most reliable source of supply.

100 years of wire making experience, unexcelled production facilities, and prompt delivery, govern their choice.

Today—write us about your requirements. Round, flat, square, oval, octagon or other shapes of wire can be furnished to the best advantage—and our engineers will gladly cooperate.



AMERICAN STEEL & WIRE COMPANY

208 S. La Salle Street, Chicago 30 Church Street, New York
And All Principal Cities

SUBSIDIARY OF
UNITED STATES STEEL CORPORATION

Quality Products *Dependable Service*

PRINCIPAL SUBSIDIARY MANUFACTURING COMPANIES:

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AMERICAN SHEET AND TIN PLATE COMPANY
AMERICAN STEEL AND WIRE COMPANY
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ILLINOIS STEEL COMPANY
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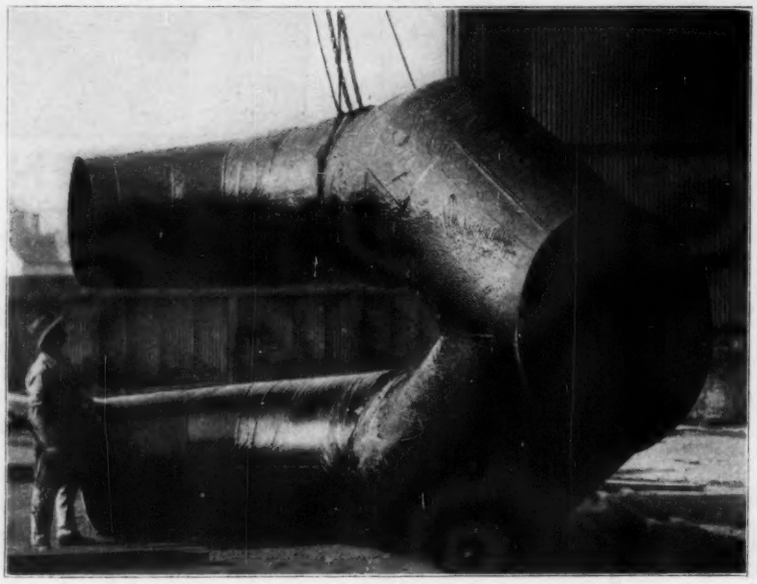
THE LORAIN STEEL COMPANY
TENNESSEE COAL, IRON & R. R. COMPANY
UNIVERSAL ATLAS CEMENT COMPANY

Pacific Coast Distributors—United States Steel Products Company, San Francisco, Los Angeles, Portland, Seattle, Honolulu. *Export Distributors*—United States Steel Products Company, New York City

ARMCO INGOT IRON

prolongs usefulness of sheet and plate equipment



This huge Armco INGOT IRON reducer joint made for the Champion Coated Paper Company, Hamilton, Ohio, required three essential qualities: Workability, weldability, and corrosion resistance. And so, pure iron was chosen.

IF your sheet and plate equipment is to be a profitable investment, you must be sure of getting a metal that resists rust and corrosion. Such a metal is highly-refined Armco INGOT IRON.

This scientifically-made iron has the longest record of *actual service* of any low-cost, rust-resisting sheets and plates. It has other properties and advantages, too—workability, weldability, heat conductivity, resistance to scaling at elevated temperatures, electrical conductivity, and *consistent uniformity*.

If you are concerned with one or more of these qualities and advantages, an experienced Armco Engineer can show you the way to long, satisfactory service.

Ask the nearest office for complete information. There is no obligation.

THE AMERICAN ROLLING MILL COMPANY
Executive Offices, Middletown, Ohio

Export: The ARMCO International Corporation

DISTRICT OFFICES:

Chicago	Detroit	Pittsburgh
Cincinnati	New York	St. Louis
Cleveland	Philadelphia	San Francisco

ARMCO

Back of this familiar trade symbol is nearly thirty years' experience in the manufacture of special analysis iron and steel sheets and plates. When you seek a rust-resisting, low-cost metal be sure to see this triangle and the words, "Armco INGOT IRON." It is your assurance of adequate and dependable service.

"BE SURE IT'S MADE OF ARMCO INGOT IRON"

Better methods . . . better products

MAKING just one thing of exceptional merit is a very straight and narrow path for any manufacturer to take, particularly if the product is cap screws. But that specialization enabled us to produce a finer cap screw than had ever been made previously. It lead to development of the Kaufman Method, *patented*, a process for making cap screws of finer accuracy and greater strength than had been practical before.

Cleveland Cap Screws are a better product because of better methods in a bigger, better plant.

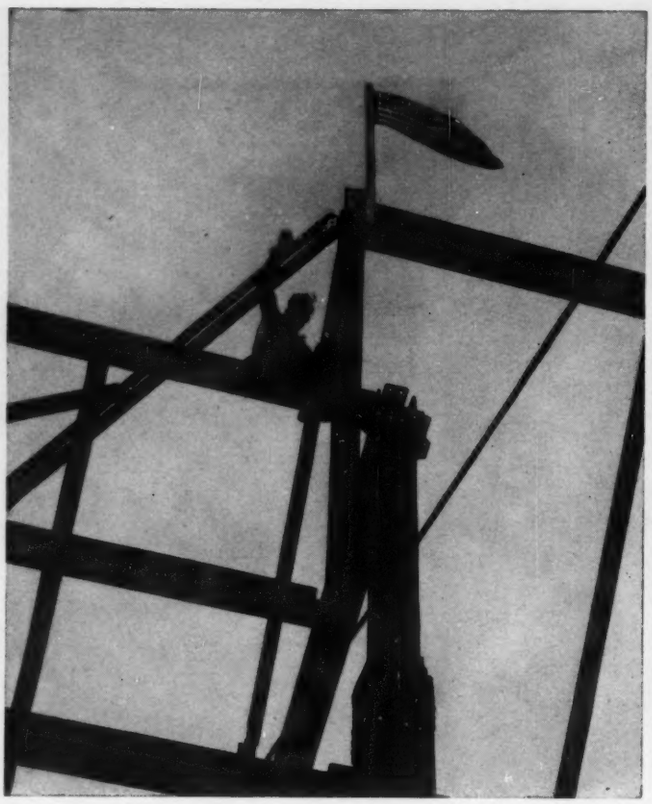
THE CLEVELAND CAP SCREW COMPANY
2934 E. 79th St., Cleveland, Ohio

Address the Nearest Company Warehouse—Complete stocks at

CHICAGO, 726 W. Washington Blvd.
DETROIT . . 520 W. Congress Street
PHILADELPHIA . 12th & Olive Sts.
SAN FRANCISCO . 548 Howard St.
NEW YORK . . . . 47 Murray Street
LOS ANGELES . . . 224 E. 11 Street

CLEVELAND CAP SCREWS

THE FLAG'S UP



That's Bill Brown up there. He has just fastened the flag over the highest column to tell the world that he and his buddies have finished raising steel. Bill is pretty well pleased with himself because this was a record job—a job where each beam and each column slipped into place and the rivet holes lined up like soldiers—a job where the reamers stayed in the tool shed.

If Bill goes back to the fabricating shop he will see "how come" all this good luck. The answer lies in the extraordinary speed and accuracy of Thomas Fabricating Machinery.

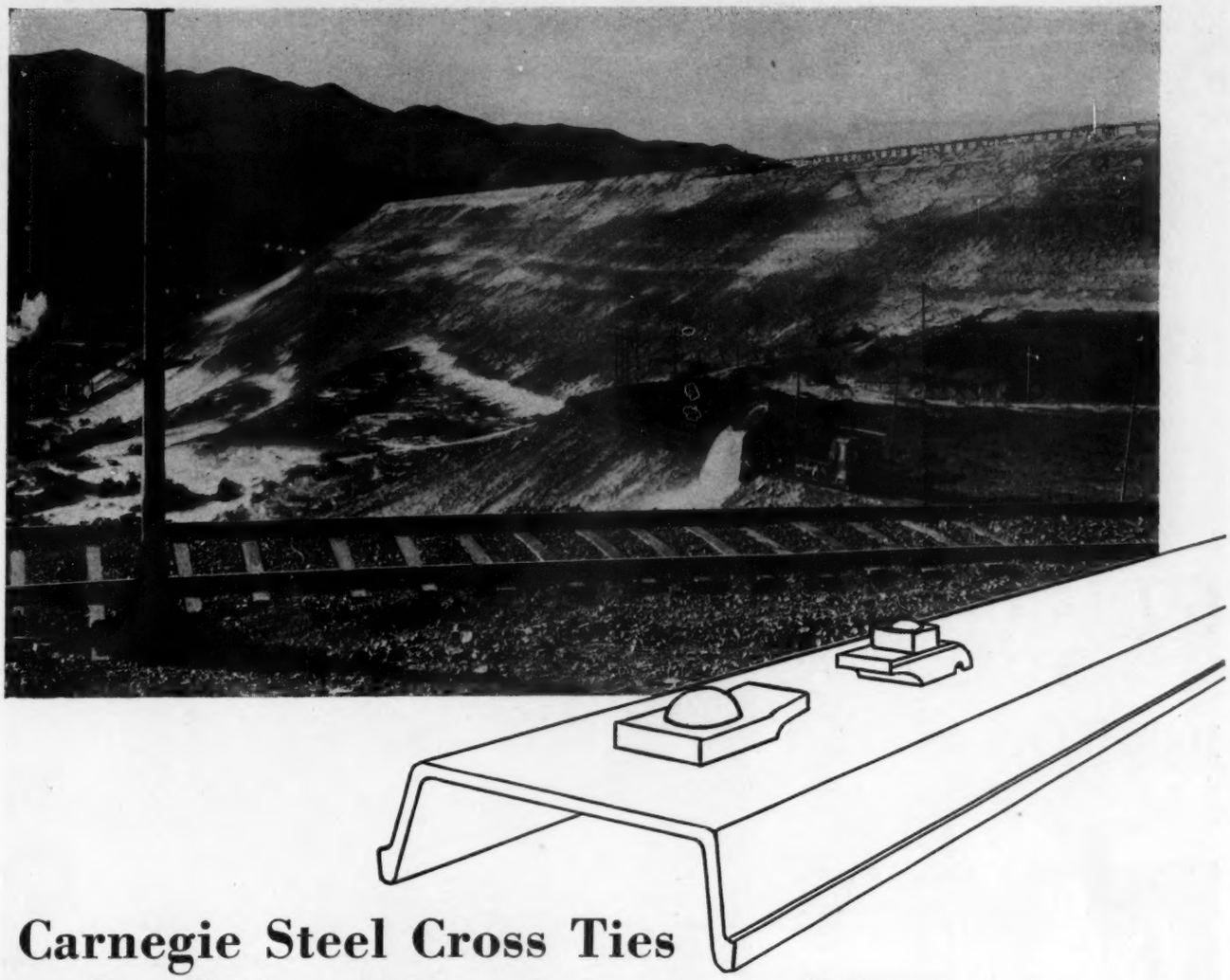
That is why Thomas has always built into their Fabricating Machinery these three essentials—quality, speed and accuracy. That is why a little higher purchase price means a much greater return on the investment.

- Beam Punches
- Multiple Punches
- Single Punches
- Gate and Squaring Shears
- Angle Shears
- Automatic Spacing Tables
- Manual Spacing Tables
- Indicator Spacing Tables
- Multiple Drills
- Roll Over Drill Tables
- Column Facers
- Angle Chamferers
- Benders and Straighteners

THOMAS

SPACING MACHINE COMPANY

CHICAGO PITTSBURGH PHILADELPHIA



Carnegie Steel Cross Ties

render effective service under severe conditions -:- -:-

Molten slag spilled from ladles soon destroys wood ties. The International Smelting Company, on their slag dump at Miami, Arizona, efficiently solved their track problem by using Carnegie Steel Cross Ties. Two 10-foot lengths of Section M-25, an I-beam type, were used to support each trolley pole. The balance of the ties are channel section M-27, illustrated above. These ties were put in service ten years ago. Today they are still in excellent condition.

Carnegie Steel Cross Ties are suitable for many uses—yard tracks, sidings, dumps, ash pits, etc. They are easily and quickly laid or removed. Made of steel, they effectively resist damage from hot cinders or slags. Economical, as they outlast wood ties a number of times and effect a considerable saving in labor.

Carnegie Steel Cross Ties are provided in a number of weights and designs for all types of portable and permanent track.

Descriptive booklet will be sent at your request.

CARNEGIE STEEL COMPANY -:- PITTSBURGH, PA.

Subsidiary of United States Steel Corporation

59

CARNEGIE
STEEL CROSS TIES

WHEN IT'S *ALLOY STEEL* . . . SEE *CENTRAL*

A STRAIN COMPARABLE TO A 1000 TON BLOW!

TREMENDOUS power. Massive proportions. Locomotive parts subjected to tensions no ordinary metal could withstand. Only the crushing impact of a 1000 ton blow is comparable to these terrific strains! Yet the locomotive drawing the long train in which you ride, travels its shiny rails with all the velvety smoothness of a ship in calm water.

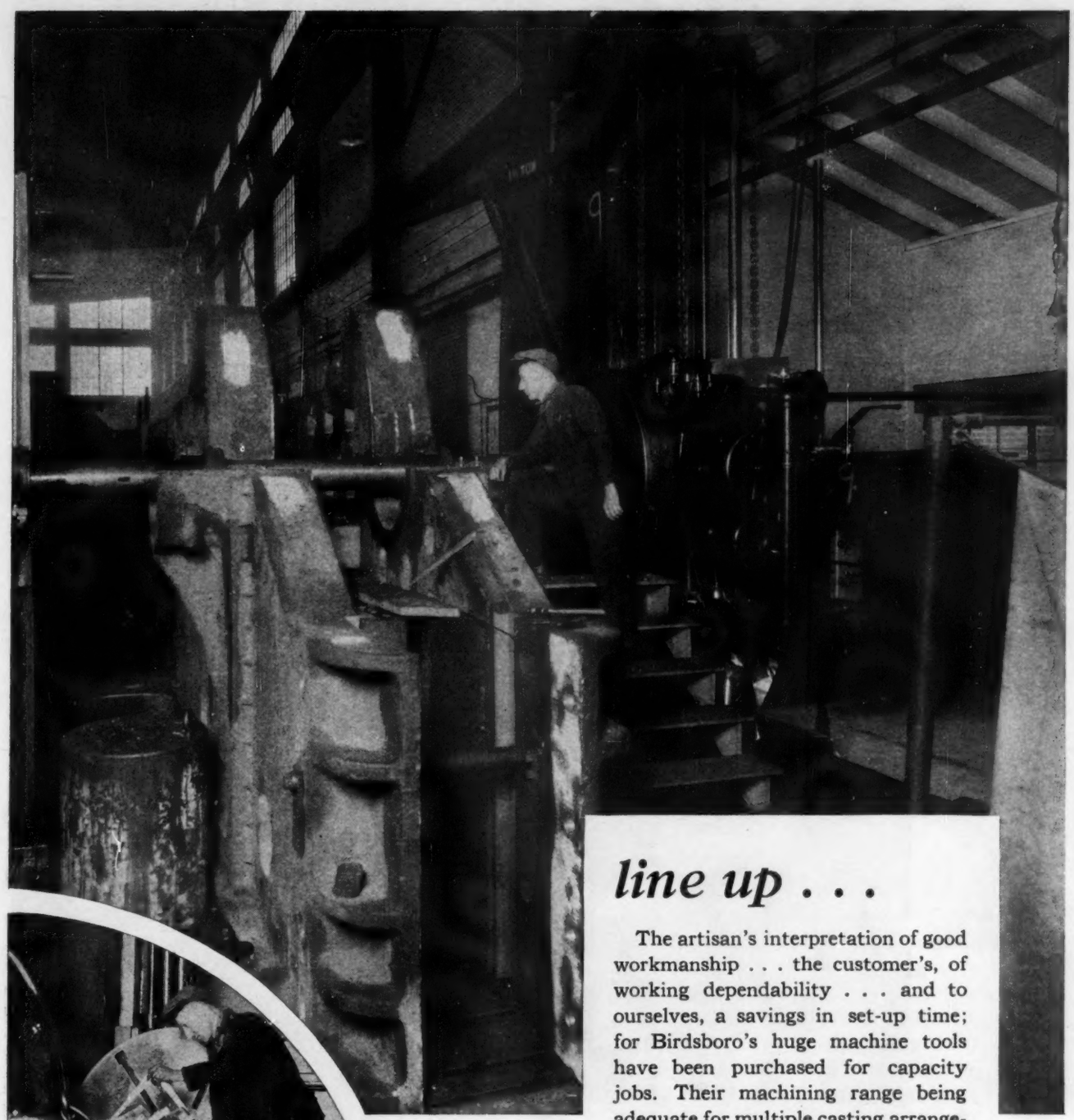
Alloy metals have made this possible. And in the development of the locomotive, Agathon Alloy Steels have played a major role.

Agathon Alloy Steels are a handiwork of the world's largest and most highly developed producers of alloy metals. A distinguished staff of famous metallurgists is maintained to assist in the solution of problems identical with yours; to recommend an alloy after a thorough study of your product; to design, if necessary, a special alloy to meet your needs.

This service is gratis, of course. You are invited to avail yourself of its convenience and economy. A short note on your letterhead is sufficient to arrange a meeting. Write it—today.

Central Alloy Steel Division
REPUBLIC STEEL CORPORATION, Youngstown, O.

AGATHON ALLOY STEELS



line up . . .

The artisan's interpretation of good workmanship . . . the customer's, of working dependability . . . and to ourselves, a savings in set-up time; for Birdsboro's huge machine tools have been purchased for capacity jobs. Their machining range being adequate for multiple casting arrangement.

The pair of carbon steel side frames (pictured) for a Buchanan 56" x 72" Jaw Crusher, cast at Birdsboro and weighing 110,700 lbs., are being bored in one operation, assuring positive *line-up* in assembly.

We feature this page that you may know Birdsboro and its facilities.

BIRDSBORO
STEEL FOUNDRY AND MACHINE COMPANY
DESIGNERS AND BUILDERS
BIRDSBORO, PENNSYLVANIA

D.O.JAMES SPEED REDUCERS

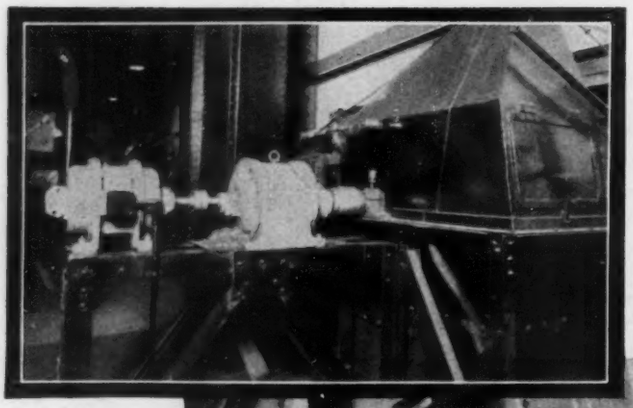
Economize Power in This Plant

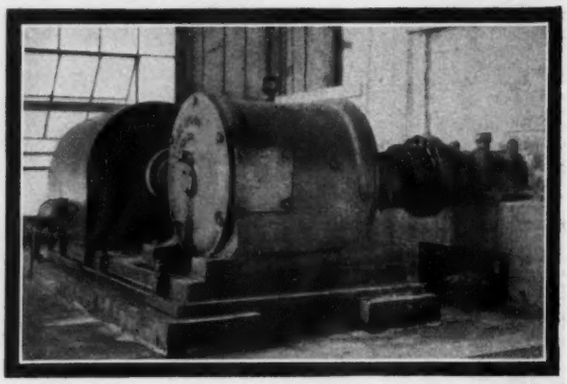
Power-Saving Products

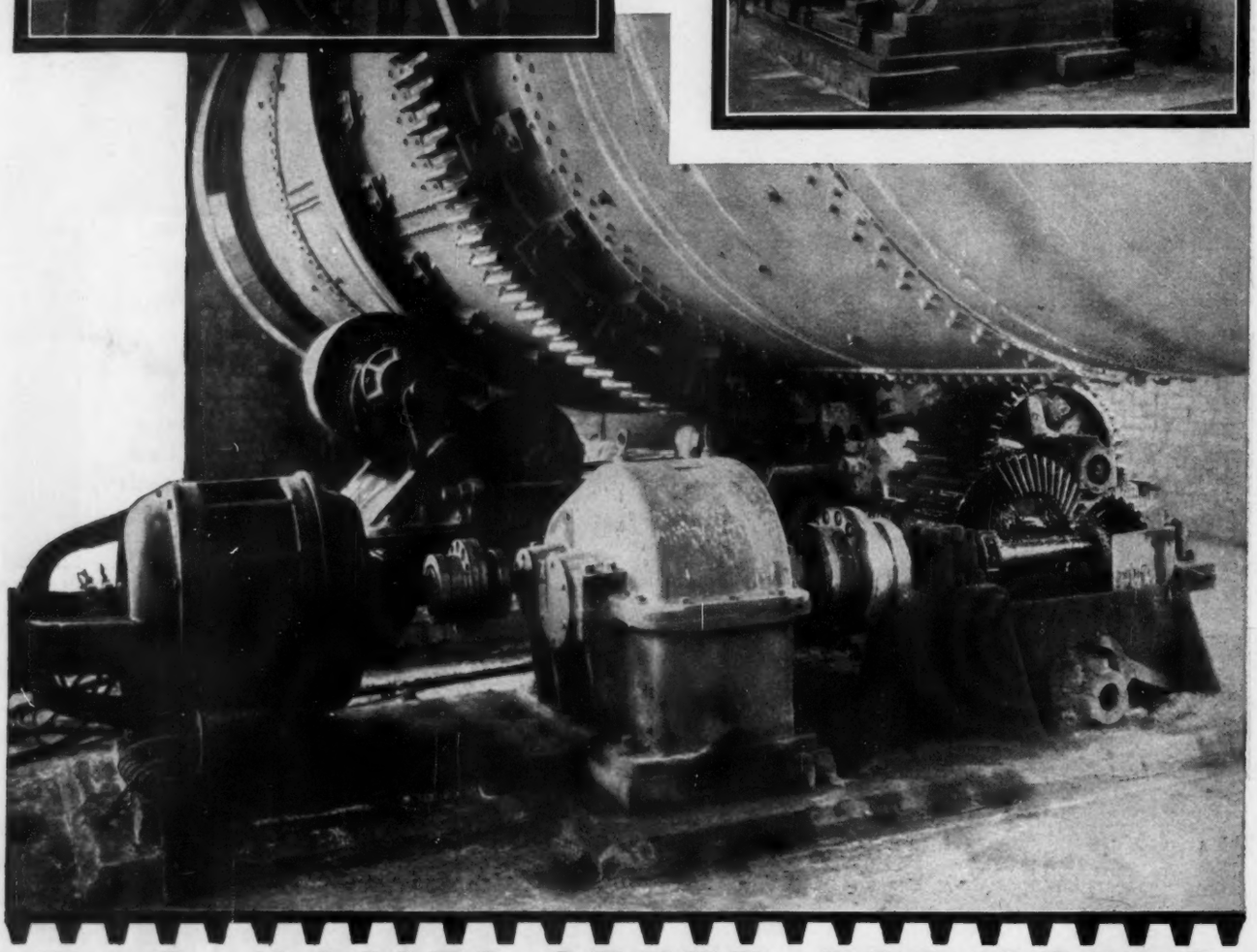
PLANETARY Spur Gear, Medium and Heavy Duty Worm Gear, Generated Continuous-Tooth Herringbone Gear Speed Reducers, in types to drive up, down, horizontally or at an angle, Cut Spur, Straight and Spiral Bevel, Mitre, Spiral, Worm, Internal, Helical and Herringbone Gears in all sizes and of all materials, Sprocket Wheels, Racks, Flexible and Universal Couplings.

D. O. James Manufacturing Company

1114 West Monroe Street • Chicago, Illinois

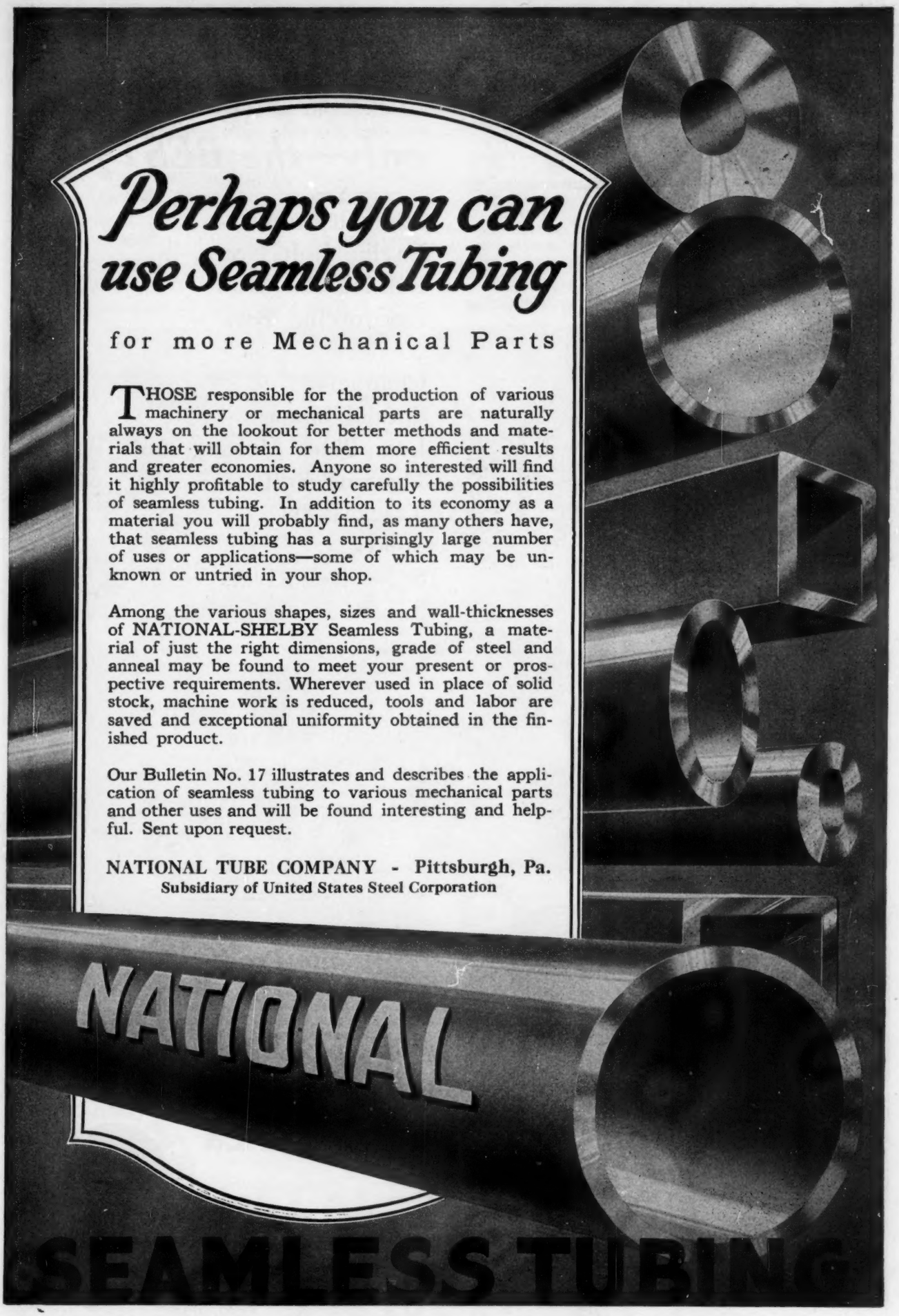






D. O. JAMES SPEED REDUCERS

ALL TYPES


Perhaps you can use Seamless Tubing
for more Mechanical Parts
THOSE responsible for the production of various machinery or mechanical parts are naturally always on the lookout for better methods and materials that will obtain for them more efficient results and greater economies. Anyone so interested will find it highly profitable to study carefully the possibilities of seamless tubing. In addition to its economy as a material you will probably find, as many others have, that seamless tubing has a surprisingly large number of uses or applications—some of which may be unknown or untried in your shop.
Among the various shapes, sizes and wall-thicknesses of NATIONAL-SHELBY Seamless Tubing, a material of just the right dimensions, grade of steel and anneal may be found to meet your present or prospective requirements. Wherever used in place of solid stock, machine work is reduced, tools and labor are saved and exceptional uniformity obtained in the finished product.
Our Bulletin No. 17 illustrates and describes the application of seamless tubing to various mechanical parts and other uses and will be found interesting and helpful. Sent upon request.
NATIONAL TUBE COMPANY - Pittsburgh, Pa.
Subsidiary of United States Steel Corporation
NATIONAL
SEAMLESS TUBING

Made in one Quality only—the BEST!

Staybolt Iron
Engine Bolt Iron
Refined Bar Iron
Reinforcing Bars
Angles
Channels
Special Shapes
Low Phos. Melting Bars
Machine Bolts
Track Bolts
Spikes
Soft Steel Rivets
Tie Rods
Lag Screws
Plate Washers
Hot Pressed Square and Hexagon Nuts
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Wrought Iron Nails
Wrought Iron Turnbuckles
Genuine Puddled Iron Rivets

"The Service Matches the Product"

Our Mills at Lebanon and Scranton, Pa., and Rome, N. Y., are among the largest and most efficiently equipped in this country. They carry large stocks and are advantageously located to make quick shipments.

Largest Producers of Wrought Iron Bars in the United States

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Wrought Iron Company of America · Lebanon, Pa. ·

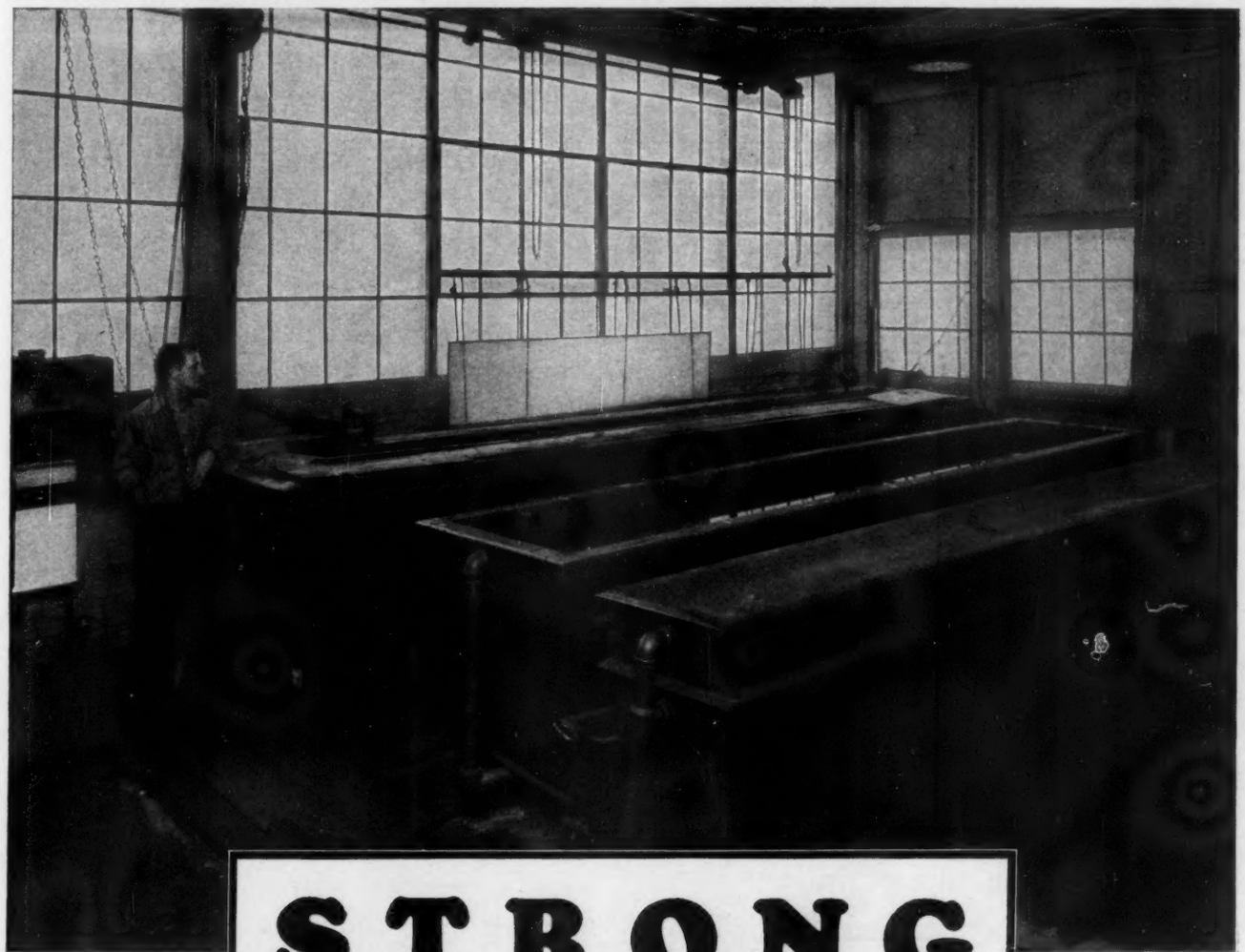
Duralumin sheet in salt bath

DURALUMIN was as yet a new material among alloys when this salt bath furnace for heat treating duralumin sheet was designed, built and installed by *Strong, Carlisle & Hammond* Engineers for a well known army airplane builder in Cleveland. It is at present in constant use by the Great Lakes Aircraft Corporation, large consumers of duralumin for aircraft structural parts.

Sheet duralumin, 24" wide, is heat treated in the salt bath furnace for 15 minutes at 940° to 950° Fahr. The sheet is taken from the heat and cold water quenched, then scrubbed in luke-warm water to remove salt, and finally passed through straightening rolls. Forming and bending must be done within 30 minutes after removal from furnace. After aging for 24 hours, the treated duralumin attains a Rockwell hardness of 90°.

S C & H electric oven furnaces are used for heat treating duralumin rivets. Work is treated in small baskets, and delivered from furnace to workmen every 20 minutes to avoid aging of the alloy before it is worked.

For a special furnace for a special job, call in S C & H Engineers.



STRONG CARLISLE & HAMMOND

SC&H Furnaces are made for annealing, case hardening, carburizing, forging, cyaniding, lead hardening, oil tempering.

SC&H Furnaces are built in all sizes of Oven, Pot, Continuous, and Special Types for Electric, Oil or Gas application.

INDUSTRIAL FURNACE MANUFACTURERS · CLEVELAND, OHIO

It is with Great Pleasure that We Announce the Purchase of the

COCHISE

ROCK DRILL MFG. CO.

LOS ANGELES, CALIFORNIA

The Manufacturers of the Famous COCHISE Rock Drills

This linking together of two great names in the Pneumatic Tool industry — THOR and COCHISE — is in direct line with the policy of the Independent Pneumatic Tool Co., which is to provide users with the highest quality tools.

Cochise Rock Drills have established an enviable reputation in the mining and construction fields of the West. They have repeatedly won highest honors in the Drilling Contests which are held in the West every few years, in proving to be the fastest cutting, most efficient and economical rock drills.

THOR Pneumatic and Electric Tools are considered the standard in all lines of industry where production methods are essential. Their design and construction have withstood the test of time and the number of prominent firms that have standardized on THOR Tools is a wonderful tribute to their supremacy.

The Cochise Rock Drill Mfg. Co. will operate as a unit of the Independent Pneumatic Tool Co. There will be no change in personnel or methods. It is our desire to extend the field of service for Cochise Rock Drills to all parts of the country so that all industries will be able to take advantage of the speed, power and economy of Cochise Drills.

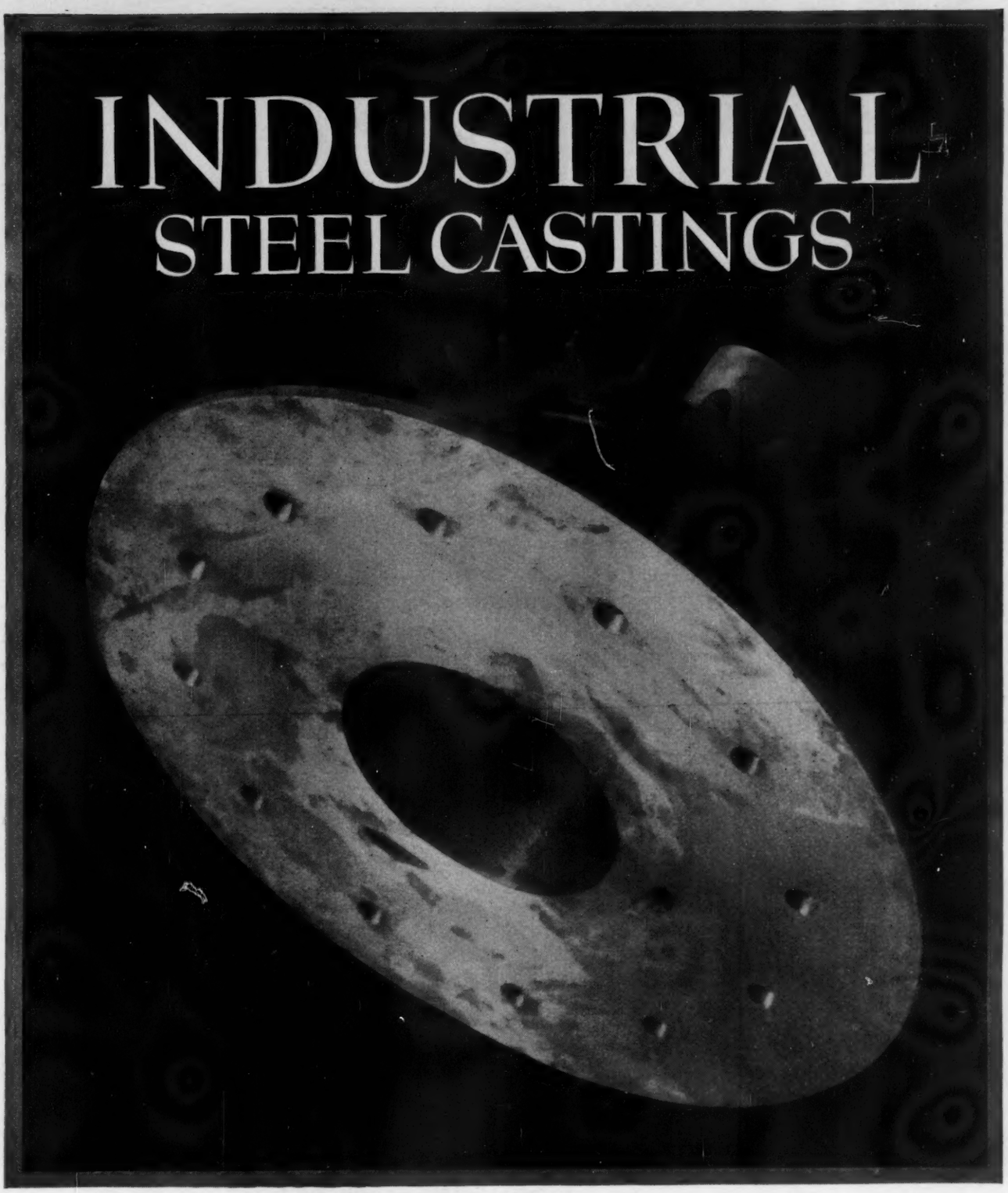
We welcome this opportunity to serve a greater clientele in the mining and construction fields and pledge ourselves to the task of upholding the high reputation that Cochise Rock Drills have established.

INDEPENDENT PNEUMATIC TOOL CO.

NEW YORK — 600 West Jackson Boulevard, CHICAGO, ILL. — LONDON

PNEUMATIC TOOLS ··· ELECTRIC Thor TOOLS ··· AIR COMPRESSORS

INDUSTRIAL STEEL CASTINGS



THIS ILLUSTRATION MADE FROM AN UNRETOUCHED PHOTOGRAPH

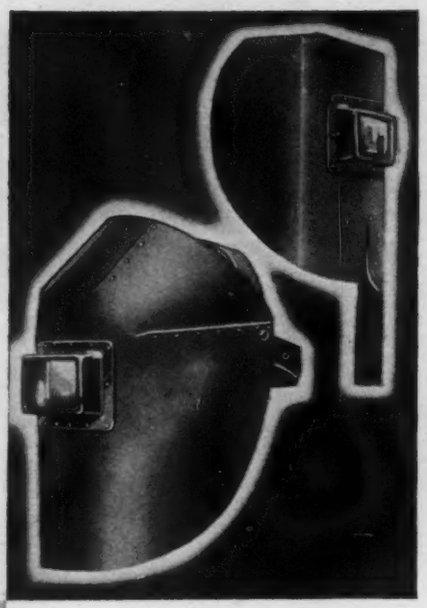
Built With Steel Castings

Do not hesitate to use Industrial Steel Castings on account of the intricacy of design involved, or the sharpness of detail required. Long experience, and facilities that represent the highest standards of modern factory practice, permit us to reproduce such patterns with remarkable fidelity. And the quality of these fine castings reduces machining costs to a minimum . . . A small trial order will allow us to demonstrate just how satisfactory Industrial Steel Castings will prove for your purpose. Or blue-prints may be sent for quotation.

THE INDUSTRIAL STEEL CASTING COMPANY . TOLEDO, OHIO

To HARDWARE *and* MILL SUPPLY Houses

All sales restrictions are removed on Wilson Arc Welding Accessories in the United States. Write at once for special offer.



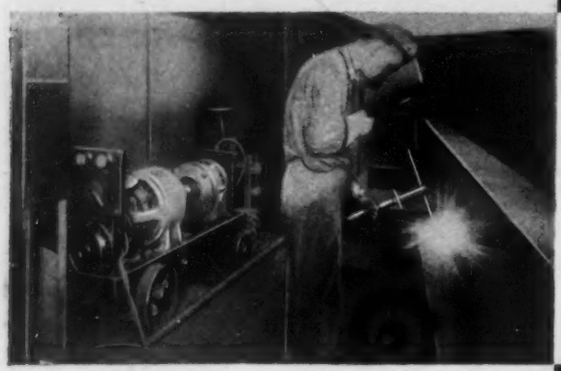
FIBRE HAND SHIELD

Made of light, durable fibre. Non-conductive — prevents arc burn. Wilson Amber Lens.

TYPE B LIGHTWEIGHT HELMET

Made of light, durable non-conductive fibre. All light rays are excluded except those coming through the Wilson Amber Lens.

The Wilson Amber Lens conforms to the requirements of the U. S. Government Bureau of Standards. Has high visibility, and protects eyes from ultra-violet and infra-red rays.



The illustration above shows an arc-welding operator using a Wilson Fibre Hand Shield and a Wilson Type A Electrode Holder.

WELDERS everywhere recognize Wilson helmets, hand-shields, gauntlets and electrode holders as the best obtainable. Welders know that Wilson Accessories are a definite *aid* to good welding. Welders *like* to work with them. The constantly increasing demand due to their widely-recognized quality makes Wilson Accessories a profitable line. Write for special offer.

TYPE R ELECTRODE HOLDER

Capacities: 300 and 600 Amperes. Spring release. Copper conductor from cable connection to electrode. Thorough ventilation of all the parts subject to heat.

LEATHER GAUNTLET

A tough leather gauntlet for arc-welding and general use. 12-inch.

ASBESTOS MITTENS AND GLOVES

Canvas-lined. Palm and thumb either plain or re-enforced. Standard lengths: 12, 14, 16-in.

TYPE A ELECTRODE HOLDER

Light-weight. Insulated against current and heat. No springs, hinges, pivot joints or other parts which can be impaired by excessive heating. Capacities: 300 and 600 amperes. Designed for welding in cramped quarters.

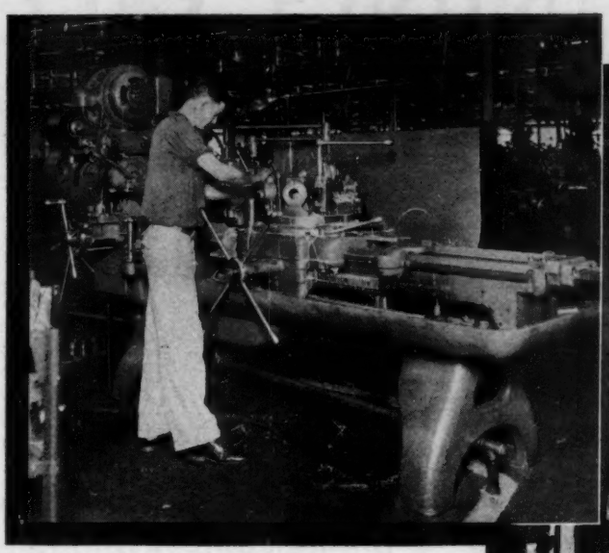
Wilson also supplies single-conductor, extra-flexible cables, made with either rubber or asbestos covering.

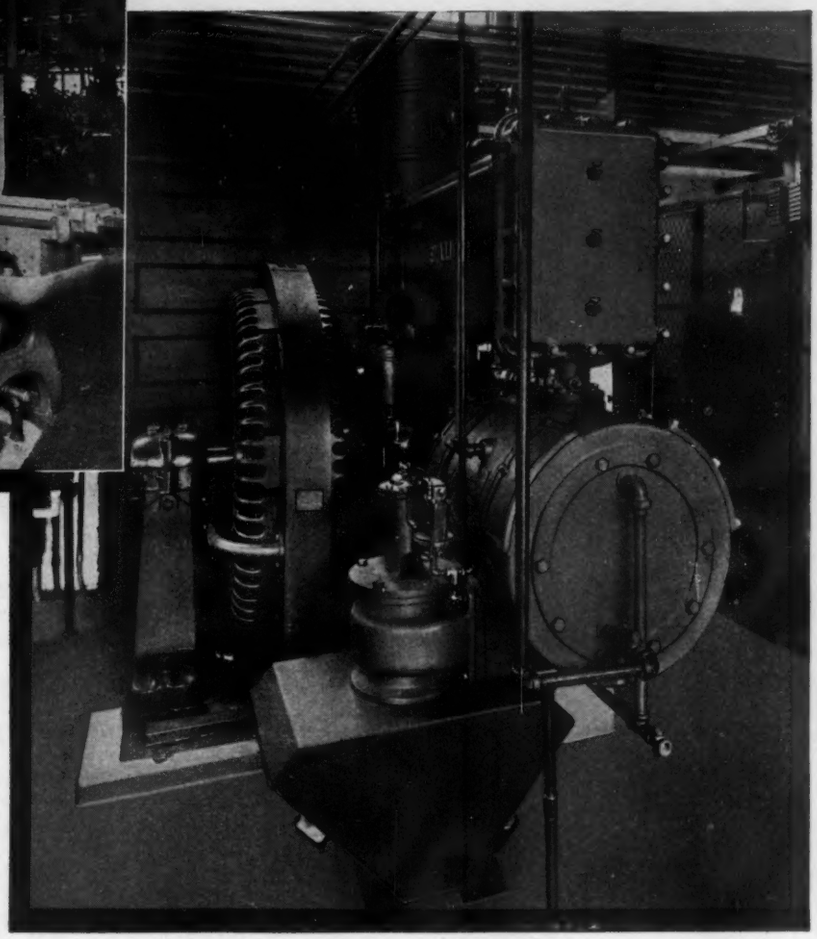
WILSON WELDER & METALS CO. INC., 24 WILSON BUILDING, HOBOKEN, N. J.

WILSON

WELDING MACHINES AND WELDING WIRE

Leaders in every industry save with Balanced Angle Compressors





Balanced Angle Compressor in plant of world-famous builder of turret lathes, and machine tools. It is a 700-cu. ft. machine, direct-connected.

Compressed Air is reducing inventories

A few minutes clipped off a few operations, and off the waiting time between, may take a surprising slice from inventory. Shorter interval from raw material to finished product, is the call of the moment. And leaders are speeding tasks, and smoothing production lines, with compressed air.

This Balanced Angle air compressor was photographed in a 70-year-old New England plant where famous turret lathes, and many other machine tools are made on large scale.

Air hoists load and unload material, speeding handling between departments. Air jets at each machine blow out the chips and dirt. Air chucks speed lathe operations. Pneumatic chipping hammers, drills, grinders, sanders, paint guns, and numerous other air tools are reducing inventories for the manufacturing industries.

And, consistent with this search for economy, more and more executives are adopting Balanced Angle air compressors.

Compressor vibration has been reduced to zero by exact balance of reciprocating forces in the distinctive balanced angle machine commercialized by Sullivan Engineers.

Capacities 300 to 5800 cubic feet.

Send for Booklet 83-J.

SULLIVAN TRADE MARK

Sullivan Machinery Company

820 Wrigley Bldg., Chicago

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TAKING OFF WITH A FULL LOAD

PREVIOUS announcements heralding a new and finer cap screw made by the latest and therefore the best methods, now culminate in the announcement of full production, the first shipment having been made April 21st.

• Thus has the new Chandler cap screw responded to today's demand for finer cap screws and thus has the demand responded to Chandler.

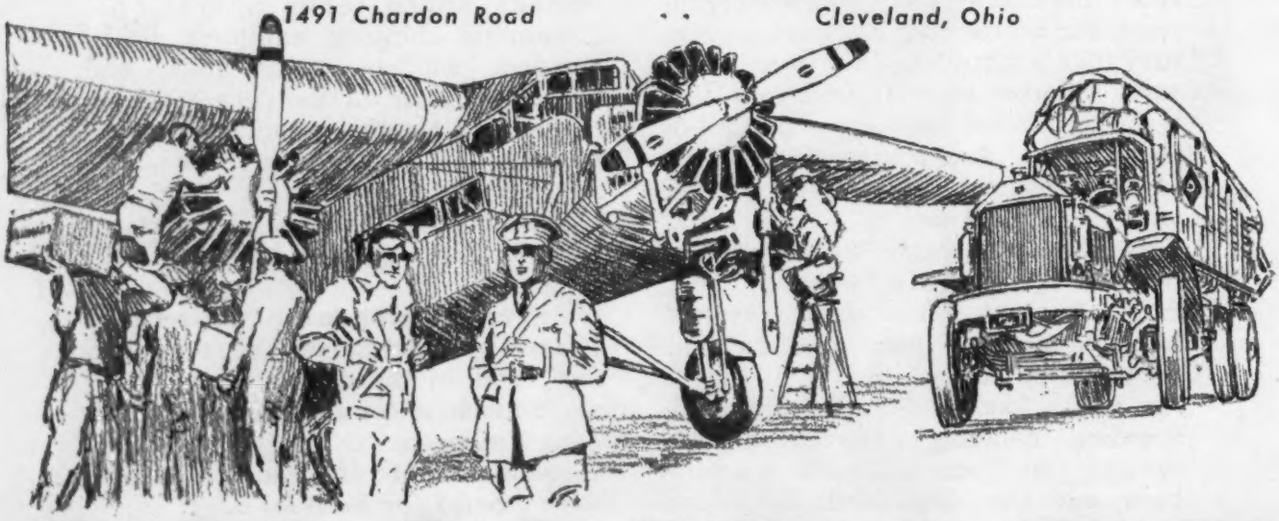
• Chandler cap screws are made entirely by automatic production methods faster than ever before seen in the industry, indicating an entirely new conception of cap screw making.

• Made to your specifications by Chandler methods, gives you a new and better service.

Write for sample of the new Chandler Cap Screw.

CHANDLER PRODUCTS CORPORATION

1491 Chardon Road · · Cleveland, Ohio



CHANDLER

Specification Cap Screws

VANCORAM

FERRO-ALLOYS
of vanadium, silicon, chromium; silico-manganese, tungsten and molybdenum, produced by the Vanadium Corporation of America, are used by steel makers in the production of high-quality steels.

This 3-Ounce Bit Carries All the Load...

The Steel Is Chrome-Vanadium

ONLY a few ounces of steel, but the screw driver bits used with Hercules Portable Screw Drivers carry the entire power load. They turn at speeds up to 600 r. p. m., and are subject to severe torsional strain and shock.

To fit the screw slots, the points of the bits must be thin in section. Yet they must have adequate strength and toughness to absorb the abuse without deformation or fracture.

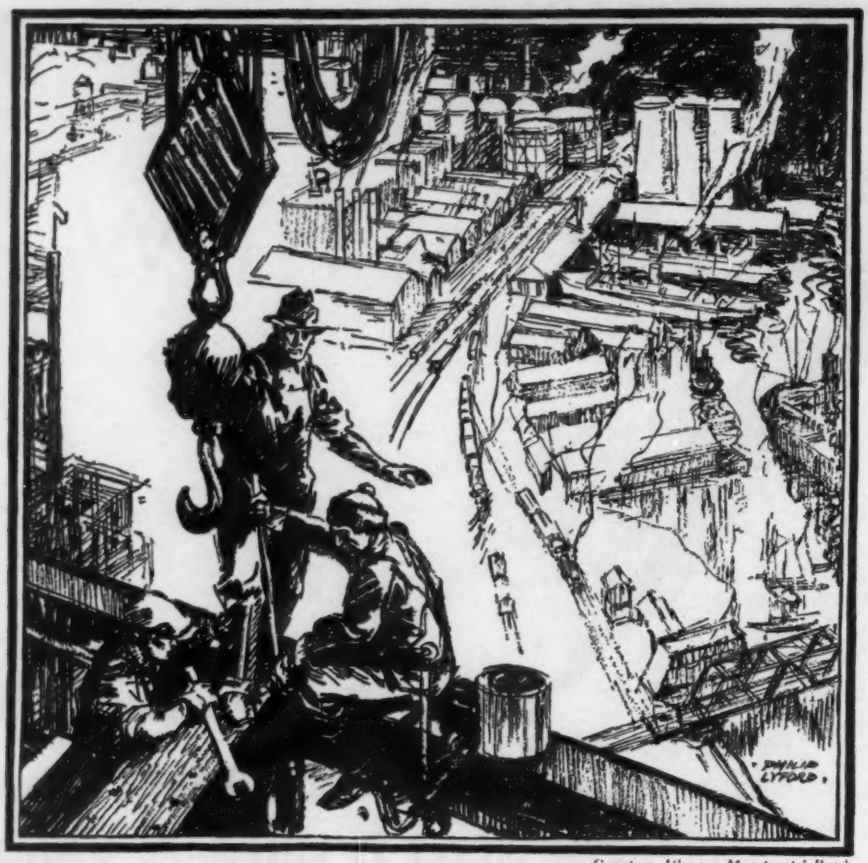
To meet these unusual and severe service conditions, The Buckeye Portable Tool Company of Dayton, Ohio, manufacturers of Hercules Portable Air Tools, employs Chrome-Vanadium Steel for screw driver bits.

What is your toughest job for steel? Are you seeking higher strength, greater toughness, superior shock-resistance and anti-fatigue qualities in parts of your product that are vital to dependable service? Our Metallurgists will gladly send complete data on types of Vanadium Steels which have proved their efficiency in severe service. Write us.

VANADIUM CORPORATION OF AMERICA
120 BROADWAY, NEW YORK, N. Y.
CHICAGO *Straus Bldg.* PITTSBURGH *Oliver Bldg.* DETROIT *Book Tower*
Plants at
Bridgeville, Pa., and Niagara Falls, N. Y.
Research and Development Laboratories at Bridgeville, Pa.

VANADIUM STEELS

for strength, toughness and durability



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More Than 10,000 Products in Stock

For more than eighty-seven years Ryerson Steel-Service has stood for immediate shipment of everything in Iron and Steel.

No order is too small to receive personal attention nor too large for prompt shipment.

There is no uncertainty or delay—no costly waiting. When you purchase steel from one of the nine Ryerson Steel-Service plants you can depend upon quick action. A 'phone call, wire or letter will start the steel on its way.

The Ryerson Journal and Stock List is the "key" to these large stocks. Make it your guide in buying steel. Write for the current copy.

Bars	Sheets, Blk. & Galv.	Turned Ground and Polished Shafting	Boiler Tubes and Fittings	Babbitt Metal	Concrete Reinforcing
Structurals	Sheets, Full Finished	Strip Steel	Welding Rod	Tool Steel	Firmtread Plates
Rails	Refined Iron	Rivets and Bolts	Forging Bars	Alloy Steel	Small Tools
Plates	Screw Stock			Allegheny Metal	Machinery, etc.

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